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Bureau of Land Management

Blacktail Watershed Assessment Report

Dillon Field Office

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Timber Creek, Blacktail Watershed, 2006

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Introduction

This document is a land health assessment of the public lands administered by the Bureau of Land Management (BLM) in the Blacktail Watershed (BTW).

This is the first in a series of documents: the Watershed Assessment Report, the Authorized Officer's Determination of Standards, and the appropriate National Environmental Policy Act (NEPA) documentation and subsequent Decision(s) changing management where needed.

The Assessment reports the condition and/or function of public land resources within the BTW to the authorized officer. The authorized officer reviews the findings in this report to determine if the five standards of rangeland health are currently being met. The authorized officer then signs a Determination of Standards documenting where Standards are met and where they are not.

In addition to the condition/function assessment, the report also contains initial recommendations developed by the interdisciplinary team (IDT) during field assessments. The recommendations in the report focus primarily on livestock grazing and timber and fuels management, but also include other programs, land uses, and activities. These include; noxious weed control, recreation activities, wildlife and fisheries habitat, and road maintenance. Impacts from all uses and programs were assessed and documented as part of this process.

The assessed condition, function and recommendations in the Assessment Report and Determination of Standards will be used in the NEPA process. An environmental assessment (EA) will be written addressing all resource concerns in the watershed. The EA will include all BLM-administered public lands covered in the assessment.

Alternative management will be analyzed wherever it is determined that:

- specific grazing allotments are not meeting the Standards
- allotments are meeting the Standards but have site specific concerns
- there are unhealthy forest conditions in the watershed
- fuels conditions are outside the natural range of variability
- other documented resources concerns

Also, if existing grazing management practices or levels of grazing use on public lands are determined to be significant factors in failing to achieve one or more of the five Standards, the BLM is required by regulation (43 CFR 4180.1) to make grazing management adjustments.

Implementation of new plans will begin in 2007, but full implementation of forest treatments, fuels projects, revised grazing plans and/or range improvement projects associated with these plans may take several years.

The new plans will be developed in consultation and coordination with the affected lessees, the agency having lands or managing resources within the area and other interested parties.

The Dillon Field Office (DFO) completed a new Resource Management Plan (RMP) in February of 2006. This document will provide program guidance in the Dillon Field Office for the next 20 years. The RMP replaces The Dillon Resource Area Management Framework Plan (1979) and the Mountain Foothills Environmental Impact Statement (EIS) - Rangeland Management Program Summary (1981).

By working on a watershed basis, a broader landscape is considered and more consistent management can be applied. It is the BLM's intent to implement watershed management cooperatively. Any changes in livestock management will be implemented through grazing decisions that address allotments or groups of allotments with a common permittee. Forest health and fuels management treatments or projects and any other management projects or changes will be implemented through decisions appropriate for the respective programs.

As with all similar BLM decisions, affected parties will have an opportunity to protest and/or appeal these decisions.

Background

The BTW is located in Beaverhead and Madison Counties, Montana and drains portions of the Blacktail and Sweetwater mountain ranges. The watershed lies within Townships 8-13 South and Ranges 4-8 West, Montana Principal Meridian (M.P.M).

The assessment area covers public lands administered by the BLM from Dillon, MT south to Clover Divide. The assessment area boundary, shown on Map A. follows grazing allotment boundaries and includes some allotments that are only partially within the watershed. Technically, the assessed area is not a distinct watershed. Watersheds are defined, and designated on maps, by natural topographical boundaries (ie. ridgelines/ drainages). Grazing allotment boundaries are determined by land ownership and these artificial boundaries may not follow topographical features. Therefore, some of the grazing allotments in the assessment area fall within one or more watersheds or hydrologic units.

Within the BTW assessment area there are approximately 275,318 total acres of land, of which 63,261 are public lands administered by the BLM. Of the public lands total, 53,100 acres are allotted for grazing, 6,088 acres are unleased and 4,073 acres are unallotted. This report addresses only land health conditions on public (BLM) land.

Elevations on public lands, within the assessment area, range from approximately 5,500 to nearly 10,000 feet. Topography varies from stream drainage bottoms and alluvial fans to steep mountain ravines and ridge tops. Average annual precipitation within the

watershed varies from 12 inches in the lower elevations and valley bottoms to 24 inches in the higher elevations.

Soils in the BTW are affected primarily by climate and parent material. They are in Frigid and Cryic temperature regimes. Elevations range from about 5,500 to 10,000 feet. The soils in the assessment are formed primarily in alluvium, colluvium, and residuum. Slopes range from undulating to very steep.

Soils are primarily sandy loams, loams and clay loams and range from shallow to very deep. Some soils are violently effervescent at the surface, while others have no lime in the profile. Rock fragments range from 15 percent in the soil surface layer to more than 50 percent rock fragments at depths of 15 inches or more. Ecological sites were mainly loamy, limy, loamy droughty, loamy steep and shallow.

Vegetation in the watershed reflects the diversity of ecological conditions across the landscape. The dominant plant communities and habitat types change according to soils, precipitation, elevation, slope and aspect (direction the slopes are facing). A wide variety of vegetation is found from wetland and riparian species dependent on water and moist soils to sagebrush and grass dominated plant communities that thrive on dryer upland sites. Forested habitats cover the higher elevations. This diverse landscape provides habitat and structural niches for a wide variety and abundance of wildlife.

None of the plants currently listed as endangered or threatened under the Endangered Species Act (ESA) are known to be growing on BLM lands in the Dillon Field Office. Fifty sensitive plant species inhabit BLM lands in the Dillon Field Office. There is suitable habitat within the BTW for several of these species, but to date only two of these plants have been found on BLM lands within the BTW assessment area. A discussion of these species is included under the "Uplands" and "Riparian and Wetland Areas" sections of this Assessment. Extensive field searches for sensitive plants haven't been conducted within the assessment area, so it's quite probable that more sensitive species will be discovered when botanical surveys are completed in conjunction with proposed projects requiring surface disturbance.

The area along the crest of Blacktail Ridge from Clover Divide northwest to Red Canyon is currently unleased for livestock grazing. It was part of the Blacktail Stock driveway Withdrawal. This withdrawal was allowed to expire in 2004 since it was no longer needed as a stock driveway. This action left this area of public land, approximately 6,088 acres, in an "unleased" status. There are currently no fences along the north side of these unleased parcels to control livestock movement from adjacent areas where livestock use is authorized. Consequently, livestock use is occurring in these areas.

The BTW contains the Blacktail Mountains Wilderness Study Area (WSA) which is managed in accordance with the *Interim Management Policy (IMP) for Lands Under Wilderness Review* (BLM Handbook H-8550-1). Management according to this policy is intended to ensure that wilderness values contained in this area are not impaired until such time as Congress either designates the area as part of the National Wilderness

Preservation System, or releases the area from further consideration as wilderness. The Blacktail Mountains WSA contains a total of 17,479 acres (27% of the BTW), of which 10,586 (the north half of the WSA) has been recommended by the BLM as appropriate for wilderness designation. Although this was BLM's recommendation to the President in 1991, the entire area currently remains under the management of the IMP.

Fire History

Several recent wildfires have occurred in the assessment area that resulted in localized changes to the landscape. The Teddy Creek fire occurred in mid–October, 1999 and burned approximately 2,500 acres of private, state and federal lands. The IDT visited portions of the Teddy Creek fire area during the summer of 2006 and found the most notable fire effects were replacement of sagebrush with native grasses and minor surface erosion on sparsely vegetated slopes.

The Sweetwater fire occurred in mid-August, 1988 and burned approximately 7,500 acres of mixed ownership. Weather events during the years following the fire produced extremely high stream flows in Little Elk Gulch, Elk Gulch, Moose Creek and associated tributaries. The IDT found evidence of debris torrents that drastically altered stream channel characteristics. This fire also consumed a large area of sagebrush/grassland and smaller, isolated timber stringers and patches. Currently, the affected streams are re-stabilizing and much of the sagebrush/grassland is nearing pre-burn conditions. Many of the recently exposed alluvial deposits in the stream channels show evidence of past similar events in layers of ash and charred woody material.

Prehistory and History of Blacktail Watershed

In conjunction with the Mountain Foothills Grazing EIS in the late 1970s, a Class II cultural resources inventory was conducted for a 10% sample of lands within the Dillon Resource Area. Results of the sample inventory located a mixture of prehistoric and historic sites throughout the watershed. Prehistorically, the Blacktail Watershed was occupied continuously from approximately 10,000 years ago. Prehistoric sites within the watershed include primarily small habitation or procurement sites.

Historically the BTW was settled during the fur trade in the 1830's. Early ranching in the region began in 1864 when the Poindexter and Orr Ranch (later the Matador) started ranching an estimated 36,000 acres of land in the Blacktail Deer Creek drainage southeast of Dillon. A stage stop was located near the P & O ranch buildings for the Helena to Corrine, Utah stage route which traveled through the watershed providing transportation to and from Virginia City or Utah. Mining has occurred in the watershed as well, but to a lesser extent in respect to the rest of the DFO.

Authorized Uses

Forest Products:

Forest resources in the watershed have been extensively utilized since the beginning of European settlement during the 1860's. Evidence in the form of old stumps from the 1800's through the 1920's can be found across all ownerships throughout the entire

assessment area. As a result, old access trails and roads are still common across the landscape.

Except for a timber trespass of approximately 80 acres in Price Canyon around 1980, there have been no recent forest management activities (timber harvest) on BLM administered lands in the watershed. Timber harvest has occurred on State and private lands in Price's Canyon, state lands along Blacktail Deer Creek, and private land in the Timber Creek Isolated allotment.

Special Recreational Uses:
There are currently three outfitters authorized to conduct commercial recreation activities on public lands in the Blacktail Mountains. All three guide/outfit big game hunting, accounting for a total of approximately 125-130 user days per year on the average. One of these is also permitted to conduct day use horseback rides in the Blacktail Mountains during the summer. This summer use was not permitted until the end of the summer of 2005, and no use has been reported to date for summer horseback rides (2006 reports are not due until the middle of January, 2007).

Mining:
Mineral activity in the BTW is currently very limited. This area varies from areas of low mineral potential to high potential for locatable mineral development. Due to numerous factors, active exploration and development is minimal. There are a few 43 CFR 3809 Notices (exploration) on file with little activity on any of these. There is one Plan of Operation that was approved in June of 2006 to process 10,000 tons of existing vermiculite mill tails. There is approximately 5 acres of disturbance associated with this site. To date no tails processing has occurred under the recently approved Plan of Operation.

With the mineral potential in this area, historic mining has taken place since the 1860's. There are numerous old shafts, adits, mills and other related features all through the watershed. Although there are no sites identified as major environmental concerns on BLM administered lands, there is the potential that an abandoned mine could cause environmental damage. BLM continues to mitigate impacts associated with abandoned mines as funding and resources are available.

There are no community pits (salable minerals) on public lands and no current exclusive mineral material sales. There are also no active leases for leasable minerals in the area.

Livestock Grazing:
There are nine individual ranches that have grazing permits on 53,100 acres (20 allotments) of public land administered by the BLM in the watershed. The allotments are shown on Map B. All allotments in the Dillon Field Office have been categorized as *Improve* (I) *Maintain* (M) or *Custodial* (C) based on resource values and opportunities for improvement. BLM administered public lands provide a large proportion of the late spring, summer and fall forage base in the watershed. There are 6,858 animal-unit months (AUMs) of livestock forage allocated on public lands within the 20 allotments

included in this assessment. This information is displayed on Table 1. for all 20 allotments that are included in this assessment.

The BLM has worked cooperatively with individual livestock permittees in the watershed for many years to develop Allotment Management Plans (AMPs) to improve grazing management. About 69% of the BLM administered land in the watershed are managed under AMPs prescribing rest rotation, deferred rotation or deferred grazing management (Table 1). Less than 20% of the BLM administered acres are in custodial allotments, where BLM management inputs are minimal because of the small proportion of public land in the allotments (see Map B).

The stocking rate on BLM lands within the watershed averages approximately 7.7 acres/AUM and varies from 4.9 acres/AUM to 60.1 acres/AUM. This variance is influenced by soils, vegetative type, topography (aspect, elevation, and slope), distance from water and local weather. The kind and class of livestock authorized within all of the allotments is cattle (cow/calf pairs and yearlings).

Table 1. also shows the authorization number, season of use and the grazing system that has been in place since the Mountain Foothills EIS was completed in 1981 for each allotment.

Table 1. Livestock Grazing Allocation and Management

Allotment name, number , and category	Authorization Number	Season of Use	[1]Grazing System	BLM Stocking Rate:	BLM AUMs	BLM Acres	State/ Private Acres	Total Acres
Blacktail Road Trailing 30603 (I)	#2505130	4/1 – 12/30	Season Long	5.4	90	484	0	484
*Blacktail Ridge AMP 10147 (I)	#2505130	7/10 – 9/9	AMP - DR	30.4	179	5434	4089	9523
Kent- Non AMP 20625 (I)	#2505130	6/1 – 1/19	Season Long	8.7	92	796	0	796
*Robb Creek AMP 20167 (I)	#2505172	8/1 – 8/30	AMP - RR	17.7	340	6025	2417	8442
Rock Creek 10512 (I)	#2505764	3/1 – 2/28	Year Long	5.0	1036	5191	2972	8163
Spring Brook 10516 (I)	#2505768	5/16 – 11/6	AMP - RR	6.3	1000	6329	9227	15557
Sweetwater AMP 10471 (I)	#2505130	5/1 – 11/30	AMP- DR	5.9	2071	12178	7828	20006
Red Canyon 00113 (M)	#2505130	8/15 – 9/24	AMP- alternating def.	6.1	367	2243	518	2761
Sweetwater Basin 10518 (M)	#2505770	7/4 – 8/12	Season Long	12.6	107	1347	2050	3397

Allotment name, number , and category	Authorization Number	Season of Use	[1]Grazing System	BLM Stocking Rate:	BLM AUMs	BLM Acres	State/ Private Acres	Total Acres
Timber Creek AMP 10533 (M)	#2505788	6/1 – 11/4	AMP – RR	4.9	741	3591	1025	4616
Anderson 20105 (C)	#2505090	6/1 – 11/30	Season Long	6.8	123	833	0	833
Axes Canyon 10535 (C)	#2505790	7/1 – 8/30	Season Long	19	2	38	0	38
*Bench Field SGC 20690 (C)	#2505130	3/1 -12/30	Season Long	60.1	49	2943	7758	10701
Red Canyon Iso. 10517 (C)	#2505769	7/1 – 10/15	Season Long	12.9	63	812	0	812
Robb Crk. Non- AMP 20631 (C)	#2505172	6/1 – 11/30	RR	13.1	57	747	0	747
Spring Brook Iso. 30677 (C)	#2505768	5/15 -6/5 10/16- 11/30	Season Long	7.3	232	1701	0	1701
Spear Place 10528(C)	#2505781	7/1 – 9/30	Season Long	6.7	47	317	0	317
Sweetwater Iso. 20666 (C)	#2505130	3/1 – 2/28	Year Long	12.7	23	291	0	291
Timber Crk. Iso. 10681 (C)	#2505788	6/1 – 10/15	Season Long	4.9	14	68	687	755
Wire Field SGC 20656 (C)	#2505130	3/1 – 6/30	Season Long	7.7	225	1732	0	1732
BLM Totals				7.7 average	6,858	53,100		

[1]*Abbreviations: RR= rest rotation, DR = deferred rotation*

Process

This assessment was done in accordance with the BLM regulations regarding Rangeland Health Standards (Standards).

- BLM Manual H-4180-1, Rangeland Health Standards Handbook and Guidance for Conducting Watershed-Based Land Health Assessments.
- Code of Federal Regulation 43 CFR, Subpart 4180
- Record of Decision (ROD) - Standards for Rangeland Health and Guidelines for Livestock Grazing Management (S&Gs) for Montana, North Dakota and South Dakota.
- Healthy Forest Initiative
- Healthy Forests Restoration Act
- National Fire Plan

Rangeland Health Standards are described in detail in the ROD Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakota- Western Montana Standards.

The preamble of the Western Montana Standards states: "The purpose of the S&Gs are to facilitate the achievement and maintenance of healthy, properly functioning ecosystems within the historic and natural range of variability for long-term sustainable use." Standards are statements of physical and biological condition or degree of function required for healthy sustainable lands. Achieving or making significant progress towards these functions and conditions is required of all uses of public lands as stated in 43 CFR 4180.1.

This assessment will report condition and/or function for the following five standards:

- Standard #1 Upland Health
- Standard #2 Riparian /Wetland Health
- Standard #3 Water Quality
- Standard #4 Air Quality
- Standard #5 Biodiversity

In addition, this assessment will report condition and/or function for forest health and fuels. Forest health can affect each of the five standards, but in this assessment will be reflected under Standard #5 Biodiversity, along with other factors that affect biodiversity. These assessments are made on an allotment scale, with the exception of Air Quality and Forest Health which are made at the watershed scale.

Condition/function statements regarding the Standards are made as:

- Proper Functioning Condition (PFC);
- Functioning At Risk (FAR) which is assigned a trend (up, down, static, or not apparent); or
- Nonfunctioning (NF)

Land Health Standards are met when conditions across an allotment are at PFC or FAR with an upward trend. This is dependent on scope and scale and determined by the Authorized Officer.

Available trend monitoring data, existing inventories, historical photographs and standardized methodology are used by an IDT to assess condition and function. In addition, Ecological Reference Areas are identified by the IDT and used to compare health and productivity of similar sites and soils. Trend monitoring data, riparian assessment data and historic photographs used for this assessment are available at the Dillon Field Office.

Format
The Upland, Riparian, Air Quality, Water Quality, and Biodiversity Standards will follow the following format:

- **Affected Environment** - This section briefly describes the area and resources that were assessed.
- **Findings, Analysis and Recommendations** - This section lists the findings and discloses recommendations developed by the IDT during the field assessments.

Uplands

Western Montana Standard #1: *"Uplands are in Proper Functioning Condition."*

Procedure to determine conformance with Standard:
The uplands were assessed on an allotment basis according to Interagency Technical Reference 1734-6 "Interpreting Indicators of Rangeland Health." This qualitative process evaluates 17 "indicators" (e.g., soil compaction, water flow patterns, plant community composition) to assess three interrelated components or "attributes" of rangeland health: soil/site stability, hydrological function, and biotic integrity. The Natural Resource Conservation Service (NRCS) has developed Ecological Site Descriptions based on specific soil types, precipitation zones and location. They describe various characteristics and attributes including what vegetative species and relative percentage of each are expected to be present on the site. The IDT refers to these site descriptions while completing the upland evaluation matrix.

The IDT reviewed the long term trend study data, conducted extensive field surveys, and used the Indicators of Upland Health assessment process to assess the functionality of the upland habitat in the BTW.

The BTW was also evaluated for weed infestations using treatment records and inventories from the Dillon Field Office, the Beaverhead and Madison County Weed Coordinators and our collective observations during the field assessments.

Affected Environment

Forests, sagebrush and grassland areas are considered uplands for purposes of this report. According to satellite imagery, 95 percent of the watershed is classified as uplands (40 percent grasslands, 39 percent sagebrush, and 16 percent forested).

The variety and distribution of plant communities and seral stages in the watershed area is a function of climate, geology, and soil combined with:

- historic uses (grazing and timber harvest)
- short term weather patterns
- disturbance regimes (drought, fire, floods and herbivory)

Current vegetative cover was calculated using satellite imagery (SIMPPLLE data). Table 2. summarizes the different cover types on all land ownerships within the BTW.

Table 2: General Cover Types Summary

Cover Type	BLM Acreage	% of BLM Acreage	Total Watershed Acreage	% of Total Acreage
Forests	10,409	16.4	31,615	11.4
Grasslands	25,564	40.4	140,423	51.0
Sagebrush/Mountain Shrubs	24,850	39.3	70,922	25.8
Riparian/Mesic Shrubs	292	0.5	3,119	1.1
Aspen	297	0.5	1,565	0.6
Other (Rock /Water/Ag)	1,849	2.9	27,674	10.1
Totals	**63,261**	**100**	**275,318**	**100**

Most of the watershed's public land uplands are dominated by either grasslands (40.4%) or sagebrush (39.3%) including mountain big sagebrush (*Artemisia tridentata spp. vasayana),* Wyoming big sagebrush (*Artemisia tridentata spp. wyomingensis*), basin big sagebrush (*Artemisia tridentata tridentata),* and three-tip sagebrush (*Artemisia tripartita*). Some of the prominent herbaceous species included in the grasslands are bluebunch wheatgrass (*Pseudoroegneria spicatum*), western wheatgrass (*Agropyron smithii*), Sandberg's bluegrass (*Poa sandbergii*), needle-and-thread grass (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*) and Idaho fescue (*Festuca idahoensis*). These same cool season grasses are prominent understory vegetation in the sagebrush habitat types. Rubber rabbitbrush (*Chrysothamnus nauseosus*), green rabbitbrush (*Chrysothamnus viscidiflorus*), fringed sagewort (*Artemisia frigida*) and broom snakeweed (*Gutierrezia sarothrae*) are common native shrubs found on numerous ecological sites throughout the watershed. If any of these shrubs have greater than 5% canopy cover on a site, it usually indicates that site has been subject to some kind of past disturbance.

Forested habitats occupy 16.4% of BLM administered land in the BTW, almost exclusively along the Blacktail (southwest) side of the watershed. A wide elevation variance promotes a diverse mixed conifer forest. Species include Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta),* limber pine (*Pinus flexilis*), Englemann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), whitebark pine (*Pinus albicaulis*), and Rocky Mountain juniper (*Juniperus scopulorum*). Also, numerous aspen (*Populus tremuloides*) stands and two species of cottonwoods, black cottonwood (*Populus balsamifera spp. trichocarpa*) and narrowleaf cottonwood (*Populus angustifolia*) contribute to structural diversity and canopy cover.

Scattered, isolated patches of curleaf mountain mahogany (*Cercocarpus ledifolius*) are found on rocky slopes and ridges throughout the watershed. It provides year-round cover and forage for deer and is a crucial source of winter forage for many wildlife species.

Special Status Plants
Wind River draba (*Draba ventosa*) is a sensitive plant species that is found in inaccessible high-elevation habitats occurring in scree and shifting talus of slopes near or above treeline. Of the four known populations of Wind River draba in Montana, the only documented occurrence on BLM lands is on Sunset Peak in the BTW.

Other sensitive plants that have been found on nearby BLM upland habitats include Idaho fleabane (*Erigeron asperugineus*), buff fleabane (*Erigeron parryi*), mat buckwheat (*Eriogonum caespitosum*), showy townsendia (*Townsendia florifera*), cushion townsendia (*Townsendia condensata*), and Taper-tip desert-parsley (*Lomatium attenuatum*). These plants typically inhabit open, rocky, often limestone-derived soil on exposed ridges and slopes in grasslands and sagebrush steppe ranging from the valley and foothill zones up to alpine habitats.

Vegetative Treatments
According to BLM records, prescribed burns were completed in the Timber Creek Allotment in 1983 and 1985 to reduce sagebrush. Approximately 171 acres were burned in 1983 in the Taylor Pasture and approximately 521 acres were burned in 1985 in the Mine Pasture. These burns have created some structural and vegetative diversity on a landscape level and have reduced encroaching conifers in these areas. The IDT noted that bluebunch wheatgrass was very robust and vigorous in these areas, and current sagebrush cover is minimal.

Findings, Analysis and Recommendations

Members of the IDT visited all the grazing allotments, as well as the unleased and un-allotted public land in the BTW during 2006 and completed 13 *Rangeland Health Indicator Evaluation Matrices* on various ecological sites and plant associations. In addition, 18 Daubenmire trend studies and over 20 permanent photo plots established in the 1970s and early 1980s were duplicated in 2006 to help determine vegetative trend. The data collected was summarized and compared to baseline data providing supporting information for interpreting the upland indicators. (see Table 3, Upland Qualitative Assessment Summary).

The vast majority of the uplands in the watershed are functioning properly and meeting the Standard for Upland Health. Table 3 outlines the findings at 13 sites throughout the watershed where the IDT completed the Indicators of Rangeland Health evaluation matrix. A moderate departure from expected conditions is analogous to a FAR rating (DOI BLM 2000). Upland sites that were found to be in the -none to slight- or -slight to moderate- departure from expected conditions category are considered to be in PFC.

Table 3. Upland Qualitative Assessment Summary

Allotment Name	Ecological Site	Plant Association	Degree of Departure from Expected		
			Soil Site Stability	Hydrologic Function	Biotic Integrity
Rock Creek 10512 (I)	Silty 10-14	Bluebunch wheatgrass/Idaho fescue	None to slight	Slight to moderate	Slight to moderate
Rock Creek 10512 (I)	Silty-droughty 15-19	Bluebunch wheatgrass/Idaho fescue	None to slight	None to slight	None to slight
Spring Brook 10516 (I)	Silty-droughty 15-19	Mountain big sagebrush/bluebunch wheatgrass	Moderate	Moderate	Slight to moderate
Spring Brook 10516 (I)	Silty-limey 15-19	Idaho fescue/bluebunch wheatgrass	None to slight	None to slight	None to slight
Sweetwater AMP 10471 (I)	Sandy 15-19	Mountain big sagebrush/ bluebunch wheatgrass	Slight to Moderate	Slight to Moderate	Slight to moderate
Sweetwater AMP 10471 (I)	Silty 15-19	Mountain big sagebrush/Idaho fescue	None to slight	None to slight	None to slight
Sweetwater AMP 10471 (I)	Silty 15-19	Mountain big sagebrush/Idaho fescue	Slight to moderate	Slight to moderate	Slight to moderate
Sweetwater AMP 10471 (I)	Shallow 10-14	Wyoming big sagebrush/thick spike wheatgrass	Slight to moderate	Slight to moderate	None to slight
Red Canyon 00113 (M)	Silty-droughty 15-19	Idaho fescue/bluebunch wheatgrass	Slight to Moderate	Slight to Moderate	Slight to Moderate
Sweetwater Basin 10518 (M)	Shallow 10-14	Bluebunch wheatgrass/Sandberg bluegrass	None to slight	None to slight	None to slight
Timber Creek AMP 10533 (M)	Silty 15-19	Mountain big sagebrush/ Idaho fescue	None to Slight	Slight to moderate	None to Slight
Red Canyon Iso. 10517 (C)	Shallow 15-19	Mountain big sagebrush/Idaho fescue	None to slight	None to slight	None to slight
Wire Field SGC 20656 (C)	Silty-stoney 15-19	Bluebunch wheatgrass/Idaho fescue	None to slight	None to slight	None to slight

On the sites rated PFC or FAR with an upward trend, the quantitative monitoring data supports the findings of the IDT. The ecological condition at these upland sites is stable or improving. Evidence of erosion appears to be remnant of historical impacts, and generally matches what is expected for that ecological site. Tall cool season bunchgrasses, specifically bluebunch wheatgrass, are moderately reduced in many sites throughout the watershed in comparison to the Ecological Site Guides. This is likely due to long-term spring and summer cattle grazing in these areas. The IDT also found sites that were in excellent ecological condition and used them as Ecological Reference Areas.

Existing management appears to be improving or maintaining upland health conditions across 19 allotments within the watershed.

Trend studies completed for the Spring Brook Allotment and comparisons with Ecological Reference Areas generally showed a static or declining vegetative trend or ecological state for sites evaluated within grazing distance from existing water sources. Conditions improve as the distance from the water increases. The composition of perennial cool season bunch grasses is well below that expected for the site. Vigor of existing cool season bunchgrasses is below expected, even considering the drought. Present erosion exceeded what was expected for that ecological site as evidenced by pedestals around the vegetation and water flow patterns larger than expected, especially in plant interspaces.

Eighty six percent of the public uplands in the BTW assessment area, covering 53,802 acres in 19 grazing allotments, unleased and unallotted public lands, are functioning properly. Approximately 14% of the public uplands, one allotment including 8,600 acres, are FAR with a static or downward trend.

The upland plant composition along the forest/sagebrush ecotone and within mid-elevation aspen stands within the BTW is changing toward more conifer dominated. Aerial photographs show the spread of coniferous forest species downslope onto benches previously dominated by sagebrush and cool season grasses. The spread of primarily Douglas-fir and Rocky Mountain juniper can be attributed, in part, to the reduced frequency of wildfire. This is discussed in more detail in the Biodiversity Standard # 5 and Forestry/Fuels sections of this report.

Noxious Weed and Cheatgrass Infestations

Noxious weeds found within the BTW that are of primary concern include houndstongue (*Cynoglossum officinale*) and spotted knapweed (*Centaurea maculosa*).

Houndstongue is scattered throughout the watershed, primarily along riparian bottoms, roads and trails. Houndstongue is toxic to animals due to high levels of alkaloids contained in the plant. Due to the difficulty in treating infestations found in riparian areas and because of its seeds ability to cling to hair and clothing, the potential is high for it to be spread to disturbed areas within the watershed. Houndstongue is an opportunistic invader (moves into disturbed areas), not an aggressive invader like spotted knapweed.

Spotted knapweed is not common in the BTW. It is widely scattered and found along a few roads and/or disturbed areas. However, because it is one of the more aggressive noxious weeds in Montana and currently is found in relatively low infestation levels in the BTW, spotted knapweed is high priority for treatment to prevent it from gaining a stronger foothold within the watershed.

Cheatgrass (*Bromus tectorum*), a winter annual invasive species, is also a concern within the BTW. It is currently found in small patches throughout the watershed in disturbed areas, past wildfire areas, riparian bottoms and adjacent south facing slopes.

Other noxious or invasive weeds present as small widely scattered infestations in the watershed include black henbane *(Hyoscyamus nigar)* and Canada thistle *(Cirsium arvense)*. Black henbane is found primarily along roads within the area. Canada thistle is common in riparian bottoms that have had disturbance.

Since 1989, BLM has been involved in cooperative weed management efforts with Beaverhead and Madison Counties. Private land owners in the BTW have also been involved in control efforts. Throughout this period, the goal has been to prevent new noxious weed infestations and control or eradicate existing infestations in the watershed using Integrated Pest Management.

All herbicide treatments have been applied by ground in the BTW. The area around Cottonwood creek has been one of the main focus areas during the annual Beaverhead County Weed Day. In 2004, 30 acres were treated and 2,500 were inventoried. In 2005, 60 acres were treated and 4,200 acres were inventoried. In 2006, 50 acres were treated and over 3,000 acres inventoried. Due to the small size of the knapweed infestations, the harshness of the climate and the elevation of the valley, biological controls have been hard to establish with only one known surviving population established on private ground.

Special Status Plants

Wind River draba occupies habitats with sparse vegetation suggesting that it is not tolerant of competition; however there are no known immediate anthropogenic threats to the Sunset Peak population. Noxious weed invasion probably poses the biggest threat to any of the other sensitive plant species that may be found in upland habitats in the BTW.

Recommendations for Upland Health:

1. Work with the NRCS to revise the grazing system and management plan for the Spring Brook Allotment. Changes in timing, duration, frequency and/or intensity of grazing should be considered. Rest and/or more deferment should be incorporated into the management of this allotment. Salting locations, herding and/or applicable range improvement projects should also be examined to determine how these tools can be used to mitigate resource concerns.

2. Continue to maintain or improve upland health in the 19 allotments and the unleased and unallotted parcels of public land that exhibit healthy or improving upland conditions.

3. Within budgetary constraints, continue or increase the use of Integrated Weed Management tools to treat noxious weeds within the BTW with spotted knapweed being the highest priority for treatment. Continue to work cooperatively with Beaverhead and Madison Counties and other agencies, landowners and partners to manage noxious weeds within the BTW. Continue the existing education effort on weed identification and prevention measures with the primary education target being hunters and other dispersed recreation users.

4. Actively encourage private landowner participation to help control weed spread. Communicate and cooperate with private landowners to gain access across their land to treat or inventory weed infestations.

5. Coordinate closely with forest health and fuels reduction treatments (commercial and non-commercial timber harvest and prescribed fire) to mitigate noxious weed and cheatgrass spread.

6. Address site specific concerns as needed on allotments in which the uplands are generally healthy or improving.

Riparian and Wetland Areas

Western Montana Standard #2: *"Riparian and wetland areas are in proper functioning condition"*

Procedure to determine conformance with Standard:
Wetlands, streams and their associated riparian areas in the BTW were evaluated in 2006 using several complimentary monitoring and evaluation methodologies: the Montana Riparian Wetland Assessment (MRWA), PFC assessment, and Riparian Cover Board. The MRWA inventories and measures riparian vegetative species composition, canopy cover, vigor and regeneration. The PFC assessment evaluates stream geometry, channel dimensions, hydrological function, riparian vegetative conditions as well as soil erosion and deposition. The Riparian Cover Boards measure changes in woody canopy cover. Streams were classified according to stream type using the Rosgen Classification System. Waters of Montana are required to support Fisheries and Aquatic Life.

Affected Environment

The BTW is primarily located within the larger Beaverhead River Watershed. Portions of the BTW also include the Ruby River Watershed. Blacktail Deer Creek and Sweetwater Creek are water quality limited streams, according to Montana Department of Environmental Quality (DEQ). The information in this section addresses the physical and to some extent the biological condition of the streams and their associated riparian and wetland habitats. The condition of riparian vegetation, stream bed materials, channel geometry and the ability of riparian areas to attenuate flood water, recharge groundwater and maintain riffles and pools are closely associated with a streams ability to support aquatic life and fisheries. Both direct and indirect impacts influence riparian and stream conditions. Direct impacts occur in the riparian area; indirect impacts may come from areas upstream, uses on adjacent ownerships or from the uplands (e.g. soil erosion).

Major streams in the north half of the watershed include Timber Creek, Cabin Creek, Elk Gulch, Little Elk Gulch, and Moose Creek (Map C.) In the southeast, the main stream reaches are the East Fork of Blacktail Deer Creek and its tributaries, Indian Creek, and Taylor Creek (Map D.) In the southwest, the main streams are Jake Canyon, Cottonwood Creek, Teddy Creek and tributaries to Blacktail Deer Creek (Map E.)

There are approximately 65 miles of stream within the BTW. Tables 4a. and 4b. show the riparian and wetland habitats and conditions in the BTW.

It can be difficult to distinguish between wetlands and riparian areas. Riparian areas lack the amount or duration of water usually present in wetlands, yet are wetter than adjacent uplands. Riparian habitats have many of the plants found in wetlands, but tend to be dryer and may not have wetland soils. Riparian species may be "wetland" species or they may be true upland species expressing greater vigor due to increased water compared to upland species.

The BTW contains a variety of riparian-wetland habitats. Habitat types vary substantially between the Blacktail and Sweetwater side of the watershed. On the Blacktail side, the higher elevation streams are steep cascading A channels. Spruce habitat types are associated with these higher elevation stream reaches. As the topography begins to flatten out near the BLM/private land boundary, more deciduous woody habitat types are found including cottonwood, aspen and/or willow (primarily geyer or booth willow). There are also several spring complexes along the crest of Blacktail Ridge, in the unleased areas of public land. These spring complexes are inhabited by herbaceous riparian vegetation, primarily sedges and rushes. One of these spring complexes feeds a unique, high mountain lake called Cooks Lake. Cooks Lake and the associated spring complex is approximately one acre in size and retains water year around.

On the Sweetwater side, the primary streams are vegetated by aspen habitat types at higher elevations. Timber Creek, Moose Creek, Elk Gulch and Little Elk Gulch are complex riparian systems that include many miles of secondary tributaries. The small springs and secondary tributaries are generally dominated by herbaceous species (sedges) or willows with interspersed aspen clones. Rocky Mountain juniper becomes more dominant as elevation drops and the lower reaches of the streams on the Sweetwater side are dominated by juniper, with remnant or skeletons of aspen, red-osier dogwood *(Cornus stolonifera)* and/or willows.

The streams on the north side of the Sweetwater Hills are generally aspen habitat types with a few of the higher elevation reaches being dominated by spruce. One of the most vigorous aspen stands in the BTW assessment area was found in Wood Canyon in an area that was burned during the Sweetwater Fire in 1988.

Riparian habitats are also discussed in the biodiversity section below.

Special Status Plants

Idaho sedge (*Carex idahoa*) is the only sensitive plant species documented to occur on BLM administered riparian and wetland habitats in the BTW. Idaho sedge occurs in subirrigated soils along stream reach BT2 of the West Fork of Blacktail Deer Creek and along stream reach BT41of Clover Creek. Meadow pennycress (*Thlaspi parviflorum*) and mealy primrose (*Primula incana*) are sensitive plant species that are known to occur on nearby BLM lands and are likely to occur within the assessment area. Meadow

pennycress most often inhabits meadows in sagebrush steppe dominated by mountain big sagebrush/Idaho fescue and mealy primrose is found in saturated, often calcareous wetlands. Several moisture-loving species, such as Baltic rush, tufted hairgrass and shrubby cinquefoil are often also present in these habitats.

Findings, Analysis and Recommendations

Prior to the IDT's assessment, BLM personnel re-read established Cover Board plots and inventoried the perennial streams in the watershed using the MRWA method. Dillon Field Office staff assessed 83 stream reaches during the 2006 field season. The MRWA and Cover Board monitoring data (where available) was evaluated and considered before making a functionality call on each stream.

Prior to this Assessment, many of the stream reaches had been identified based upon mapped information, aerial photos, and USGS Quads. A number of these reaches were found to be dry washes and have been removed from the stream/wetland inventory.

The riparian condition on 27 stream miles was either PFC or FAR with an upward trend; 30 stream miles were FAR with a static, not apparent or downward trend, or NF. The riparian status of perennial stream miles within the watershed is shown in the following Tables and is summarized below in Figure 1. Table 4a. shows reaches that drain into the Beaverhead River Hydrologic Unit; Table 4b. shows reaches that drain into the Ruby River Hydrologic Unit. Riparian condition is also shown on Maps C. D. and E. attached to this document.

Table 4a. Riparian and Wetland Habitat, Hydrologic Unit Beaverhead River

Major Stream	Minor Stream	Tributary Stream or Spring	Allotment	BLM Reach ID	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Blacktail Deer Creek	Drains directly to Blacktail Deer Creek	Blacktail trib.	Sweetwater AMP #10471	RU70	JUNSCO/CORSTO		0.75 Miles
				RU240	SALGEY/CARNEB		0.60 miles
				RU241	JUNSCO/CORSTO		0.56 miles
				RU238	JUNSCO/CORSTO		1.07 miles
				RU239	JUNSCO/CORSTO		0.26 miles
		Blacktail trib.	Timber Creek #10533	RU284	JUNSCO/CORSTO		0.45 miles
		Cabin Creek	Timber Creek #10533	RU38	POPTRE/CORSTO		0.37 Miles
				RU39A	POPTRE/CORSTO	0.71 miles	
				RU39B	POPTRE/SALBEB	0.56 miles	
				RU244	SALBEB/CARNEB	1.41 miles	
		E. Fork Blacktail Deer Creek	Robb Creek AMP #20167	BT28A	SALGEY/CARNEB	2.52 miles	
				BT28B	SALGEY/CARNEB	0.08 miles	
		Elk Gulch	Sweetwater AMP #10471	RU13A	POPTRE/CORSTO		0.53 miles
				RU13B	POPTRE/CORSTO		0.64 miles
				RU13C	POPTRE/CORSTO		1.90 miles
				RU14	JUNSCO/CORSTO		0.50 miles

Major Stream	Minor Stream	Tributary Stream or Spring	Allotment	BLM Reach ID	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
		Elk Gulch	Sweetwater AMP #10471	RU12	POPTRE/CORSTO		1.98 milea
				RU12A	POPTRE/CORSTO		1.98 miles
				RU12B	POPTRE/CORSTO		0.88 miles
				RU12C	PICEA/GALTRI		0.88 acres
				RU4	PICEA/GALTRI		0.76 miles
				RU121	POPTRE/CORSTO		0.58 miles
				RU125	POPTRE/CORSTO		0.47 miles
		Moose Creek	Sweetwater AMP #10471	RU17A	JUNSCO/CORSTO	0.36 miles	
				RU16F	JUNSCO/CORSTO		0.82 miles
				RU16G	POPTRE/CORSTO	0.56 miles	
				RU15B	SALGEY/CARUTR	0.44 miles	
				RU15C	SALGEY/CARUTR		1.94 miles
				RU15F	SALGEY/CARNEB		0.47 acres
				RU15E	SALGEY/CARUTR	0.33 miles	
				RU15D	SALGEY/CARUTR	0.37 miles	
				RU16A	POPTRE/CORSTO		0.67 acres
				RU16B	SALGEY/CARNEB		0.51 miles
				RU16E	SALGEY/CARUTR		0.72 miles
				RU16C	SALGEY/CARUTR		0.18 miles
				RU16D	JUNBAL		0.66 miles
				RU17B	JUNSCO/CORSTO	0.94 miles	
				RU18	POPTRE/CORSTO		0.93 miles
				BT285	SALGEY/CARNEB		0.35 miles
		Timber Creek	Timber Creek #10533	RU48	JUNSCO/CORSTO		0.50 Miles
				RU49A	JUNSCO/CORSTO		0.46 miles
				RU49B	SALGEY/CARNEB		0.55 miles
				RU36	POPTRE/CORSTO		0.99 miles
				RU37A	POPTRE/CORSTO		0.93 miles
				RU37B	SALBEB/CATUTR	0.69 miles	
	Ashbough Canyon	Van Camp Creek	Timber Creek Isolated #10681	RU108	PSEMEN/CORSTO	0.24 miles	
	Blacktail Deer Creek	Ashbough Canyon	Unallotted	BT120	PSEMEN/CORSTO	1.20 miles	
		Blacktail tribs	Bench Field SGC #20690	BT234	PICEA/GALTRI	0.91 miles	
				BT97	PSEMEN/CORSTO	0.71 miles	
		Cottonwood Creek	Blacktail Ridge AMP #10147	BT78	PSEMEN/CORSTO	1.11 miles	
				BT79	PSEMEN/CORSTO		0.22 miles
				BT80	PSEMEN/CORSTO	0.62 miles	
				BT81	SALGEY/CARUTR	0.60 miles	
				BT98	PSEMEN/CORSTO	0.55 miles	
		Jake Canyon	Bench Field SGC #20690	BT103	PSEMEN/CORSTO	0.65 miles	
			Blacktail Ridge AMP #10147	BT104	PICEA/CORSTO		0.48 miles
				BT105	PICEA/GALTRI	1.75 miles	

Major Stream	Minor Stream	Tributary Stream or Spring	Allotment	BLM Reach ID	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
				BT106	SALGEY/CARUTR		0.40 miles
		Price Creek	Kent Non AMP #20625	BT232	SALGEY/CARUTR	0.29 miles	
		Red Canyon trib.	Red Canyon #113	BT299	SALGEY/CARUTR		2.0 acres
		West Fork Blacktail Deer Creek	Blacktail Road Trail #30306	BT2	SALGEY/CARUTR		0.96 miles
		West Fork Blacktail Deer Creek trib.	Stock driveway #9999	BT70	SALGEY/CARUTR		0.58 miles
				BT95	SALGEY/CARUTR		0.65 miles
	East Fork Blacktail Deer Creek	Alkali Creek	Robb Creek AMP #20167	BT189	CARUTR	0.24 miles	
				BT190	SALGEY/CARUTR	0.30 miles	
		Crows Nest Creek	Robb Creek AMP #20167	BT 188	POPTRE/CORSTO	0.77 miles	
		E Fork Blacktail Deer Creek tribs.	Robb Creek AMP #20167	BT 180	SALGEY/CARUTR		0.18 miles
				BT181	PICEA/GALTRI	1.64 miles	
				BT183	POPTRE/CORSTO	0.23 miles	
				BT182	PICEA/GALTRI	0.74 miles	
				BT30	PICEA/GALTRI	1.40 miles	
				BT186	PICEA/GALTRI	0.93 miles	
		Indian Creek	Robb Creek AMP #20167	BT 187	PICEA/EQUARV	0.99 miles	
		Taylor Creek	Robb Creek AMP #20167	RU179	PICEA/GALTRI	0.94 miles	
	Price Creek	Teddy Creek	Stockdriveway #9999	BT31	SALGEY/CARUTR	1.25 miles	
				BT62	SALGEY/CARUTR	0.50 miles	
	W Fork Blacktail Deer Creek	Springs	Stockdriveway #9999	BT300	CARUTR		4.0 acres
	Wagner Creek	Wagner Creek trib.	Sweetwater AMP #10471	RU152	POPTRE/CORSTO	0.74 miles	
Sage Creek	Basin Creek	Cooks Lake	Stockdriveway #9999	BT60	SALGEY/CARUTR		0.96 miles

Table 4b. Riparian and Wetland Habitat; Ruby River Hydrologic Unit

Major Stream	Minor Stream	Tributary Stream or Spring	Allotment	BLM Reach ID	Vegetative Community Type Hanson et. al. 1995	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Ruby River	Ledford Creek	Ledford tribs.	Robb Creek Non AMP #20631	BT184	POPTRE/CORSTO		0.65 miles
				BT185	SALGEY/CARUTR		0.30 miles
	Ruby River	Robb Creek	Robb Creek AMP #20167	BT 178	PICEA/GALTRI		0.58 miles
	Sweetwater Creek	Red Canyon	Sweetwater Basin #10518	RU173	SALGEY/CARUTR		0.26 miles
		Sweetwater Creek	Spring Brook Isolated	RU102	JUNCSO/CORSTO	0.31 miles	
				RU100	SALEXI		0.18 miles

Major Stream	Minor Stream	Tributary Stream or Spring	Allotment	BLM Reach ID	Vegetative Community Type Hanson et. al. 1995	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
			#30677	RU101	POPANG/CORSTO		0.18 miles
		Sweetwater Creek trib.	Red Canyon Isolated #10517	RU138	SALGEY/CARUTR		0.53 miles
				RU148	POPTRE/CORSTO	0.82 miles	
		Sweetwater Creek trib.	Spear Place #10516	RU147	PICEA/GALTRI	0.20 miles	
		Sweetwater Creek tribs.	Spring Brook #10516	RU80	POPTRE/CORSTO	0.74 miles	
				RU81	POPTRE/CORSTO		0.58 miles
				RU82	POPTRE/CORSTO		0.68 miles
				RU83	PSEMEN/CORSTO		0.30 miles
				RU84	POPTRE/CORSTO		0.41 miles

Table 5. provides the common name as well as the scientific name for the Community Types Abbreviations as described by Hansen et. al 1995, Cooper et. al, 1999

Table 5. Riparian Community Types

Abbreviation	Community Type
CARNEB	Nebraska sedge (Carex nebrascensis
CARUTR	Beaked sedge (*Carex utriculata)*
JUNBAL	Baltic rush (*Juncus balticus)*
JUNSCO/CORSTO	Rocky Mountain juniper/red-osier dogwood (*Juniperus scopulorum/Cornus stolonifera)*
PICEA/CORSTO	Spruce/red-osier dogwood (*Picea engelmannii/Cornus stolonifera)*
PICEA/EQUARV	Spruce/horsetail (*Picea engelmannii/Equisetum arvense*)
PICEA/GALTRI	Spruce/sweetscented bedstraw (Picea engelmani/ Gallium triflorum
POPTRE/CORSTO	Quaking aspen/red-osier dogwood *(Populus tremuloides/Cornus stolonifera)*
POPANG/CORSTO	Narrowleaf cottonwood/red-osier dogwood (*Populusangustifolia/Cornus stononifera)*
PSEMEN/CORSTO	Douglas fir/red-osier dogwood (*Pseudotsuga menziesii/Cornus stolonifera)*
SALBEB/CARUTR	Bebb willow/beaked sedge *(Salix bebbiana/Carex utriculata)*
SALGEY/CARNEB	Geyer's willow/nebraska sedge (Galex geyeriana/Carex nebrascensis
SALGEY/CARUTR	Geyer's willow/beaked sedge (*Salix geyeriana/Carex utriculata)*

Generally, the IDT found most of the riparian habitat in the East Fork of the Blacktail and along the Blacktail side of the BTW in PFC and most of the riparian habitat along the Sweetwater side in FAR. Resource concerns related to streams and wetlands observed by the IDT include alteration of stream morphology (channel shape and gradient), composition, cover, structure and vigor of streamside vegetation (specifically conversion from aspen, willows and sedges to Rocky Mountain juniper) and excessive sediment. Where juniper has increased and out competed most other riparian vegetation, channel

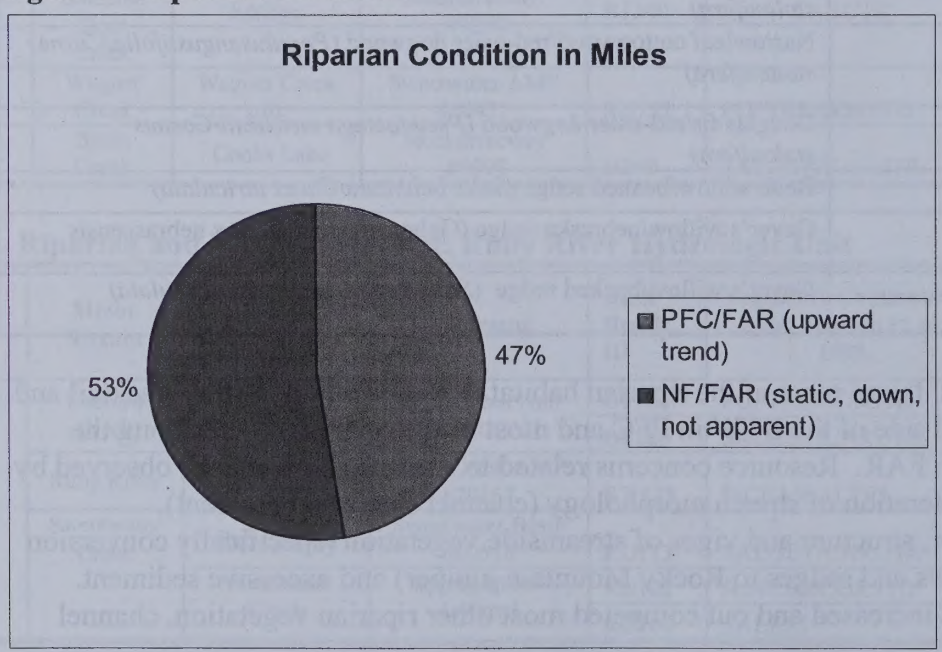
degradation has reduced the extent of riparian habitat. This change is most pronounced on lower Timber Creek, Moose Creek, Elk Gulch and Little Elk Gulch.

As mentioned in the background information, the Sweetwater Fire burned in August, 1988. Due to the lack of vegetation in the upper watershed, weather events during the first couple of years following the fire produced extremely high stream flows in Little Elk Gulch, Elk Gulch, Moose Creek and associated tributaries. The IDT found evidence of debris torrents that drastically altered stream channel characteristics, especially in the lower, juniper dominated reaches of these streams. The upper reaches or areas where deciduous woody vegetation was more dominant, these high flows had less of an impact to stream channels. Channels in the lower reaches of the primary tributaries, and some of the secondary tributaries, of these three streams were entrenched up to 20 feet during these events causing water tables to drop and altering the hydrology of adjacent wetlands, floodplains and riparian areas. Currently, some reaches of Moose Creek are re-stabilizing. Livestock use in the lower reaches of Little Elk Gulch and Elk Gulch has not allowed these streams to stabilize to date. Livestock exclosures on these reaches show striking contrast to the remainder of the reaches.

Due to low water flows, dysfunctional or limited livestock water developments, steep topography, limited shaded areas, and past and current livestock management, most of the small springs and secondary tributaries on the Sweetwater side have been negatively impacted by livestock trailing, grazing and loitering.

The steeper, high elevation forested stream reaches along the Blacktail side of the watershed were PFC. The spring complexes along the crest of Blacktail Ridge, however, were FAR primarily due to impacts from livestock. Excessive hummocking was found around the perimeter of Cooks Lake and adjacent spring complexes.

Figure 1. Riparian Condition



Many of the springs within the watershed are developed, that is the natural soils have been excavated, pipes or dams have been built, and crushed stone has been placed. Spring boxes were traditionally constructed in the center of a spring to optimize water yield at a time when the ecological significance of springs was little understood. At times, hydrology was altered and resource values were diminished. In some cases a small area was fenced to protect the spring, but in many cases the spring source is not protected or spring structures have fallen into disrepair and the fences have become dysfunctional. Current management direction supports maintenance of hydrology. Alternatives analyses are conducted to determine whether it is feasible to develop springs and where spring boxes might be best located to maintain resource values. Well managed springs have the potential to support rare plants, macroinvertebrates, insects, fish, springsnails, amphibians and migratory birds as well as providing water for wildlife and livestock. Management, restoration and conservation of springs are resource management objectives for the BLM.

Twenty nine springs, both developed (20) and undeveloped (9), were identified through the assessment process. The IDT visited 20 of the 29 isolated springs; all of which were found to be FAR. Documented concerns with spring developments include lack of exclosures, exclosures in disrepair, leaking troughs, poor location of troughs, and missing wildlife escape ramps. Additional concerns noted during the course of the assessment are reduced wetland function due to compaction, loss of vegetation, and loss of the potential for diversity of life forms.

The long term drought has negatively impacted riparian and wetland resources and springs throughout the watershed. Guidance for evaluating intermittent and ephemeral streams indicates that management can result in perennial streams shifting to intermittent and likewise, intermittent streams can shift to ephemeral. Several springs have become drier, probably as a combination of drought and past and current impacts to the spring source.

Special Status Plants

Heavy grazing and cattle trails were impacting both populations of Idaho sedge when they were recorded in 1997, and the IDT documented excessive hummocking and trailing impacts in 2006. The population along BT2 is vulnerable to road improvement and construction. Road development can reduce or degrade habitat through increased runoff, pollution and physical disturbance. Road use probably has little impact on the Idaho sedge, however maintenance or widening could lead to habitat loss.

Recommendations for Riparian Health:

1. Develop or revise AMPs on the Spring Brook, Spring Brook Isolated, Sweetwater AMP, Sweetwater Basin, Timber Creek and Red Canyon Allotments. Implement management measures that will improve streambank stability and increase riparian vegetation (e.g. aspen, willow, red-osier dogwood, sedges). Changes in timing, duration, frequency and/or intensity of grazing should be considered to allow these streams to improve. Rest and/or more deferment should be incorporated into these allotments.

Salting locations, herding, and/or applicable range improvement projects should be examined to determine how these tools can be used to mitigate resource concerns.

2. Consider treatments to mitigate conifer (primarily juniper) encroachment into riparian areas, specifically along the mid to lower reaches of Timber Creek, Elk Gulch, Little Elk Gulch and Moose Creek. Treatments could include prescribed fire, herbicide (e.g. Spike 20P) and/or mechanical thinning. Carefully evaluate current cheatgrass and weed infestations when planning treatments.

3. Where applicable, use offsite water developments to mitigate riparian impacts, while maintaining hydrology and resource values. Protect spring source and a portion of the spring brook. Repair deteriorated spring structures. Rebuild fencing to encompass a greater portion of the spring area. Where possible, relocate tanks well beyond streams and wetlands to create a buffer. Evaluate existing spring flows when looking for new offsite water developments.

4. Implement management to reduce or eliminate livestock trailing impacts along BT2 and BT41 with emphasis on maintaining and enhancing occupied and potential Idaho sedge habitat.

5. Coordinate with Beaverhead County to address county road maintenance practices adjacent to Idaho sedge habitat along stream reach BT2.

6. Address site specific concerns as needed on allotments in which the riparian areas are generally healthy or improving.

7. Within budgetary constraints, continue or increase the use of Integrated Weed Management tools to treat noxious weeds within the BTW with spotted knapweed being the highest priority noxious weed to treat. Where accessible and cost effective, treat houndstongue to prevent further spread. When a biological control for houndstongue is approved for use by the Animal and Plant Health Inspection Service (APHIS), release these insects into the larger infestations, generally along riparian areas, in the BTW to help control the spread of houndstongue.

Water Quality

Western Montana Standard #3: *"Water quality meets State standards"*

Procedure to determine conformance with Standard:
The Montana DEQ is responsible for making calls on water quality. Montana DEQ has been in the process of assessing the condition of streams, establishing reference sites and developing water quality restoration plans for the Beaverhead and Ruby Watersheds. For the BTW Assessment, the IDT used a combination of assessment methodologies to evaluate the watershed characteristics and the stream systems. Upland, riparian and forest health assessments were used to determine how BLM management is affecting

water quality. The IDT also looked for evidence of current and historic mining, abandoned beaver dams, and erosion from roads.

The goal of the Clean Water Act, the foundation for the Montana water quality law, is to "restore and maintain the chemical, physical and biological integrity of the Nations waters." To meet that goal, waters of Montana are required to support beneficial uses. According to Montana's Draft 2006 Integrated 303d/305b Water Quality Report, non point source pollution accounts for 90 % of the stream and 80 % of the lake impairments statewide. Atmospheric deposition is the leading cause of impairment to lakes. Stream nonpoint source pollution, however, is directly related to land use. Farms and ranches cover two thirds of the state and agriculture is Montana's leading industry. Pollutants from agricultural nonpoint sources include sediment, nutrients, salinity, thermal impacts, bacteria and pesticides. Grazing in riparian areas is Montana's second leading source of stream impairment.

Affected Environment

Refer to Riparian and Wetland Areas section above.

Findings, Analysis and Recommendations

Montana DEQ has two reference sites which are located within the BTW Assessment Area: one site on Cottonwood Creek on State Land in Section 23, and another on the East Fork of Blacktail Deer Creek in Section 21 in the State Wildlife Management Area.

Blacktail Deer Creek, the West Fork of Blacktail Deer Creek, and Sweetwater Creek are listed as water quality impaired streams. Following is a list of beneficial uses and probable sources for impairment for streams within the assessment area that appear in the 2006 Report:

Table 6. Montana DEQ 303-d listed streams in the BTW Assessment Area

Name	Beneficial Uses	Probable Sources of Impairment
Sweetwater	Aquatic Life, Cold Water Fishery, Primary Contact Recreation	Rangeland Grazing Unspecified Unpaved Road or Trail Irrigated Crop Production
Blacktail Deer Creek	Aquatic Life, Cold Water Fishery, Primary Contact Recreation	Grazing in Riparian Zones Irrigated Crop Production Livestock (Grazing or Feeding Operations Flow Alterations from Water Diversions Highway/Road/Bridge Runoff (Non-construction Related) Channelization
West Fork Blacktail Deer Creek	Aquatic Life, Cold Water Fishery, Primary Contact Recreation	Mine Tailings Forest Roads (Road Construction and Use) Grazing in Riparian Zones

The BLM understands that non-point source pollution needs to be addressed for waters of the State regardless of whether they are or are not meeting water quality standards and that non-degradation rules apply to waters that meet state standards.

Land use in the Blacktail and Ruby Watersheds includes hardrock mining and timber harvesting in addition to farming and ranching. Agricultural non-point sources tie back to sources such as sedimentation, nutrients, etc., and mining impacts result in pollution from heavy metals. In addition to sediment associated with agriculture, sediment running off unpaved roads is also a concern. The IDT found non-point pollution sources similar to State wide findings as well as the more specific findings noted in the draft Ruby River Watershed Water Quality Restoration Plan.

Recommendations for Water Quality:

1. Continue working with Montana DEQ and local Watershed Committees in the development and implementation of water quality restoration plans. The Beaverhead River Watershed Water Quality Assessment and Restoration Plan is ongoing; the "Ruby River Watershed Water Quality Restoration Plan and Total Maximum Daily Loads" document will likely be approved in the next few months.

2. Implement Best Management Practices to address non-point source pollution. The major land uses on BLM lands are grazing, timber harvesting, forest health, mining and roads associated with these activities.

Air Quality

Western Montana Standard #4: *"Air quality meets State standards"*

Procedure to determine conformance with Standard:
The Clean Air Act of 1990 as amended (42 U.S.C. 7401 et seq) requires the BLM to protect air quality, maintain Federal and State designated air quality standards, and abide by the requirements of State Implementation Plans.

The Environmental Protection Agency has delegated the authority to implement the provisions of the Clean Air Act to the State of Montana. Determination of compliance with air quality standards is the responsibility of the State of Montana. All of southwest Montana is in attainment, meaning that the air resource meets or exceeds all National Ambient Air Quality Standards.

Affected Environment

The BTW is located within the Montana/Idaho Airshed Management Area. The closest population center in the vicinity is Dillon, Montana located to the north of the BTW. Dillon's population is 4,035, with a population of only 8,950 for all of Beaverhead County, most of the latter living within a few miles of Dillon (www.exploredillon.com).

The 1977 Amendments to the Clean Air Act resulted in the development of Air Quality Classes under the provisions of Section 160, Prevention of Significant Deterioration. The BTW is located within a Class II airshed.

The 1998 Interim Air Quality Policy for Wildland and Prescribed Fires requires states to develop smoke management plans. The Montana/Idaho Airshed Group developed the Montana/Idaho Smoke Management Program. Prescribed burning is done in accordance with the Montana/Dakotas Fire Management Plan and is coordinated with MT DEQ and the Montana/Idaho Airshed Group. During prescribed fire season, the Smoke Monitoring Unit supports the Montana/Idaho Airshed Group to prevent or reduce the impact of smoke on area communities–especially when that smoke could contribute to a violation of national air quality standards. During the summer wildfire season, the Smoke Monitoring Unit assists state and local governments in monitoring smoke levels and providing information about smoke to the public, firefighters, and land managers.

Findings, Analysis and Recommendations

Air Quality in Southwest Montana is excellent. The closest Ambient Air Quality monitoring site to the assessment area is located south of the area administered by the Dillon Field Office in Idaho Falls. Butte is the closest Montana State Particulate Matter (PM) 10 non-attainment Area. A PM 2.5 emission is a pollutant level of concern and the State of Montana is charged with developing a strategy to address PM 2.5 emissions. Most PM 2.5 emissions are generated by fire.

Predominant winds in BTW are out of the northwest, west and southwest. For the major part of the year, the Air Quality Standard is met throughout Southwest Montana. Air quality issues in the planning area center mainly around smoke. Smoke contributors include wildfire, prescribed fires, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. Wildfire can produce short-term adverse effects on air quality. Air quality and visibility can deteriorate due to temporary air stagnation during wildfire events, which are most common during the months of July, August, and September. Concerns regarding human health revolve around smoke from wildland and prescribed fire.

Recommendation for Air Quality:

1. Continue to follow Burn Plans and coordinate with the Smoke Monitoring Unit of the Montana Idaho State Airshed Group.

Biodiversity

Western Montana Standard #5: *"Provide habitat as necessary, to maintain a viable and diverse population of native plant and animal species, including special status species"*

Procedure to determine conformance with standard:
This Standard is an overall assessment of biodiversity and wildlife habitat. The present state of each allotment and habitat type was compared to the natural and historic condition. The indicators described under the definition of Standard #5, as well as condition/function of the other standards, specifically uplands and riparian, were considered to determine whether or not the Biodiversity Standard was met.

The IDT considered the range of natural variation within this ecosystem as well as the species composition, condition of available habitat, and forest health to determine the condition/function of biodiversity. The wildlife habitat niches expected are: grasslands (short and mid grasses), bare ground, small streams, riparian/wetlands, sagebrush steppe, conifer forests, aspen stands, and various mixes of these components. Providing habitat for special status plant and animal species is key to meeting the biodiversity standard.

Affected Environment

Special Status Species

Special status species are vital to maintain the biodiversity in the watershed. Only two species that occur in the watershed are listed under the Endangered Species Act (ESA), the bald eagle and gray wolf. Table 7. also lists all Special Status Species, including BLM sensitive species, that occur within the BTW during all or part of the year. Special status plant species were discussed in the Uplands and Riparian sections above.

Bald eagles are known to nest along the Beaverhead River corridor adjacent to the BTW. Winter concentrations of bald eagles occur in BTW near open water and where prey is available. Cooperative interagency monitoring is occurring through the Montana Bald Eagle Management Plan. Recovery efforts for bald eagle and restrictions around nests have had little effect on current land use authorizations. Bald eagles are currently proposed for delisting under the ESA.

Widespread occurrences of gray wolves outside of primary recovery zones have continued to increase The minimum recovery goal for wolves in the northern Rocky Mountains is 30 breeding pairs and at least 300 wolves for three consecutive years, a goal that was attained in 2002 (www.fws.gov). Under the reintroduction rules, wolves that are within the re-introduction area but are not within a national park or national wildlife refuge are treated as a "proposed threatened" species, rather than endangered, for Section 7 consultation purposes. Wolves occurring within the BTW are outside of the primary recovery zone, and are considered as non-essential experimental populations. As wolf – livestock conflicts increase, it will generally result in removal or relocation of offending wolves which may preclude the potential establishment of stable packs in the BTW. A Montana state management plan is being developed to direct wolf management after delisting.

Table 7. Special status wildlife species occurring within the analysis area.

List of all Special Status Species that are known to occur within the watershed.	Current Management Status of the Species.	Occurrence: Resident * (R) Transient *(T)	Preferred habitat
Gray Wolf *(Canis lupus)*	Proposed threatened in experimental areas.	T	All
Bald Eagle (*Haliaeetus leucocephalus*)	Threatened - proposed for delisting	T	Riparian/wetland
Ferruginous Hawk (*Buteo regalis*)	Sensitive	R	Sagebrush shrubland
Hairy woodpecker (*Picoides villosus*)	Sensitive	R	Forest Riparian/wetland
Loggerhead Shrike (*Lanius ludovicianus*)	Sensitive	R	Sagebrush shrubland
Northern Goshawk (*Accipiter gentilis*)	Sensitive	R	Forest
Peregrine falcon *(Falco peregrinus)*	Sensitive	R	Riparian/wetland
Sage Grouse (*Centrocercus urophasianus*)	Sensitive	R	Sagebrush shrubland
Sage Sparrow (*Amphispiza belli*)	Sensitive	R	Sagebrush shrubland
Swainsons Hawk (*Buteo swainsoni*)	Sensitive	R	Riparian/wetland Sagebrush shrubland
Pygmy Rabbit (*Brachylagus idahoensis*)	Sensitive	R	Sagebrush shrubland
Prebles Shrew (*Sorex preblei*)	Sensitive	R	Sagebrush shrubland
Westslope cutthroat trout *(Oncorhynchus clarki lewisi)*	Sensitive	R	Streams

Genetically pure westslope cutthroat trout (WCT) have drastically declined in the area. WCT in Montana are currently listed as a sensitive species by the BLM and as a species of special concern by MFWP. There are currently two streams in the BTW that support pure WCT populations, Cottonwood and Jake Canyon Creeks. These remaining pure populations are small isolated populations found in headwater habitat, and are a result of some form of barrier that has prevented introgression by rainbow trout. Three streams, Teddy, Rock, and Robb Creeks, also support populations of slightly hybridized WCT.

Sagebrush Habitats and Sagebrush Dependent Species

Sagebrush and grassland habitat types are the dominant vegetation communities comprising 80% of public lands in the analysis area. Mountain big sagebrush is the dominant habitat type, providing crucial winter habitat for mobile wildlife species such as mule deer, pronghorn antelope, and sage grouse, and localized yearlong habitat by sagebrush-obligate species such as pygmy rabbit. Intermingled occurrences of basin big sagebrush, tall three-tip sagebrush, and several low sage species add to the diversity of vegetation and habitat structure.

Much of this habitat adjoins the Blacktail and Robb Ledford Game Ranges managed by MTFWP and the Beaverhead-Deerlodge National Forest. The BTW lies within portions of FWP Hunting Districts (HD)324, 325 and 326 for deer and elk, HD 321 for antelope, and HD 332 for moose. Mountain goats also inhabit high elevation habitat on Sunset Peak in Robb Creek Non-AMP allotment in HD 331. The following table lists the season of use for habitats used by primary game species, with respect to biodiversity standards.

Table 8. Primary game species and habitat use within the BTW

Species	Forested	Sagebrush	Riparian
Antelope		Y	
Elk	S,C	W,C	Y
Moose	Y	Y	Y
Mule deer	S,C	W,C	W
Blue grouse	Y		Y
Ruffed grouse	Y		Y
Sage grouse	S	Y	B

Y=yearlong, W=winter, S= summer, C=calving/fawning, B=breeding/brooding

Sage grouse populations and sagebrush habitats have declined throughout the west due to significant habitat losses range-wide from habitat conversion for agricultural needs, livestock grazing, and wildland fire. Previous petitions for listing the sage grouse under the ESA emphasize the need for region-wide assessments addressing habitat conditions and population stability. This emphasizes the importance of maintaining the integrity of mid- to late-seral sagebrush habitats on public lands, not only for sage grouse but for all sagebrush obligate species.

No large scale habitat conversions have occurred in the watershed in the past 20 years. A wildfire in the Sweetwater allotment altered 7,567 acres of sagebrush habitat in 1988 that is now similar to pre-burn habitat conditions.

Important sage grouse seasonal habitat is centered on breeding and winter complexes. Nesting usually occurs within two miles of the lek, where suitable habitat is available. Brood rearing habitats require a mix of forbs and insects for a high protein diet, usually in association with riparian habitats. Winter diets consist of almost 100% sagebrush. The *Management Plan and Conservation Strategies for Sage Grouse in Montana* completed by the Montana Sage Grouse Working Group will be used as a guideline for future management of sagebrush habitat.

Riparian, Aquatic and Wetland Habitat and Associated Species

Within the BTW there are 10 perennial streams on public land that support cold water fisheries. Common sport fish species in the area are brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*) and rainbow x cutthroat hybrids (*O. Mykiss x clarki lewisi*). These non-native species were introduced into the area in the early 1900's or before. Brook trout are the most common salmonid found in the assessment area, occurring in most perennial waters capable of supporting cold water species. Rainbow

trout are incidentally to commonly found in the lower to middle reaches of several streams. Hybrid cutthroat are found in several streams and support good fisheries in some.

Several fish streams within the assessment area support popular recreational fishing. The East and West Forks of Blacktail Deer Creek support a popular sport fishery for brook, rainbow and hybrid cutthroat trout. Combined, these two popular small stream fisheries provide upward of 300 angler use days per year (MFWP 2004). Teddy Creek provides around 30 or so angler days (MFWP 2004). Several other streams likely support light fishing use as well, but were not reported through MFWP angler use surveys.

Other native species such as mountain whitefish (*Prosopium williamsoni),* longnose sucker (*Catostomus catostomus),* white sucker (*Catostomus commersoni)*, mottled sculpin (*Cottus bairdi*), longnose dace (*Rhinichthys cataractae*) are found primarily in Blacktail Deer Creek and the lower portions of the larger tributaries to Blacktail Deer Creek. Table 8 shows fish streams within the BTW and species of fish present.

Table 9. Fish Streams in the BTW.

Stream	Fish Species Present
Cottonwood Creek	WCT/100%
Jake Canyon Creek	WCT/100%
Rock Creek	WCT/98%
Robb Creek	WCT/98%
Teddy Creek	WCT/94%
East Fork Blacktail Deer Creek	Brook trout, rainbow trout, mountain whitefish, rainbow x WCT hybrids
Price Creek	Rainbow x WCT hybrids
West Fork Blacktail Deer Creek	Brook trout, rainbow trout, mountain whitefish
Moose Creek	Brook trout
Sweetwater Creek	Brook trout

Riparian habitat and stream conditions are discussed above under the Riparian Standard. Riparian and wetland habitats comprise approximately 2% of the BTW. These habitats are generally dominated by willow or aspen communities along foothills streams, and often represent stringers of habitat extending below forested areas into sagebrush/ grassland habitat into lower elevation private lands in the major stream bottoms. These communities around springs and seeps in sagebrush habitats represent important islands of habitat diversity as well as crucial water sources for all wildlife.

Riparian habitats receive a disproportionate amount of wildlife use with approximately 75% of all wildlife species in this area utilizing riparian habitat for at least some portion of their annual life cycle. These riparian areas provide essential habitat for moose, elk, beaver, sage grouse brood rearing and neo-tropical migrant songbird nesting. This habitat is used extensively by sage grouse during brood rearing, as was documented by the IDT and field technicians during 2006 field season. Spring developments can provide a clean water source for wildlife, but have often proved to be fatal when escape ramps are

not installed in them. As stated in the Riparian standard above many developments were found to be in disrepair, and were also lacking escape ramps for birds and small mammals, in which wildlife remains were found.

The Partners in Fight Bird Conservation Plan for Montana was prepared "to focus on restoring healthy ecosystems that will sustain productive and complete bird communities" (Montana Partners in Flight, 2000), and identified 141 species for priority status in five habitat groups. Most of these birds are summer residents that use habitats ranging from lower elevation wetlands to high elevation forests for breeding and raising young. Some species are migratory but small populations may be present yearlong depending on seasonal conditions. The USFWS has also identified a list of 28 "Birds of Conservation Concern" for the Rocky Mountain Region. Eight of these species have been documented to occur on public lands within the BTW during part or all of the year (Table 10.)

Table 10. USFWS Birds of Conservation Concern documented in BTW.

Ferruginous hawk (*Buteo regalis*)	Golden eagle *(Aquila chrysaetos)*
Swainson's hawk (*Buteo swainsoni*)	Peregrine falcon *(Falco peregrinus)*
Prairie falcon *(Falco mexicanus)*	Red-naped sapsucker *(Sphyrapicus nuchalis))*
Loggerhead Shrike (*Lanius ludovicianus*)	Brewers Sparrow *(Spizella breweri)*

The majority of riparian habitats on the Sweetwater side of the BTW are juniper, aspen and willow riparian habitat types. The taller structural component of these areas supports a broader array of species compared with habitats dominated by shrubs or herbaceous vegetation. Rocky Mountain juniper is increasing within deciduous riparian habitat on most streams in Timber Creek, Elk Gulch and Moose Creek drainages within the BTW. Rocky Mountain juniper provides valuable habitat diversity in riparian habitats until its density begins to displace other woody and herbaceous species. This usually occurs in areas with altered disturbance regimes that provide juniper a long-term competitive advantage over other riparian species.

Within the Robb Creek AMP, with the exception of East Fork of Blacktail Creek, many of the tributaries are relatively steep, conifer-dominated stream systems that are relatively stable and provide excellent habitat used extensively by big game species.

Cooks Lake, a unique, high mountain, spring fed lake, near the crest of Blacktail Ridge, provides habitat for tiger salamanders (*Ambystoma tigrinum*) and likely breeding and rearing habitat for other amphibians such as the Columbia spotted frog (*Rana luteiventris*) and boreal chorus frog (*Pseudacris maculata*) which are both found in the area. In addition, it is an important watering source for wildlife. The wetland/riparian habitat associated with Cooks Lake and nearby spring complexes provides important habitat for a variety of wildlife species including sage grouse, big game and song birds.

Conifer Forest Habitat, Forest Health and Fuels Management

Forested habitats comprise approximately 16% of the BTW, most of which lies along the south side of the valley. The close association of much of this forested habitat with adjoining sagebrush and riparian habitats supports a broad array of wildlife species. This

habitat provides security cover for big game species and migration corridors between seasonal habitats, as noted above in Table 8. The drainages associated with this forested habitat create an important niche for many migratory bird species.

Mid-elevation forests dominated by Douglas-fir provide a wider array of habitat that is generally drier and more available throughout the year. Dry Douglas-fir and juniper stands have expanded in recent decades, enlarging existing stands, and pioneering into adjacent habitat. The resulting habitat conversion to Douglas-fir or Rocky Mountain juniper has reduced forage availability in riparian habitats more so than shrub steppe habitat.

In broad terms, a healthy forest is one that maintains desirable ecosystem functions and processes. Aspects of forest health include biological diversity; soil, air, and water productivity; ability to withstand natural disturbances; and the capacity of the forest to provide a sustaining flow of goods and services for people.

Evidence of historically recurring fire is found throughout the analysis area in forests and woodlands. Fire exclusion caused primarily by fire suppression and livestock management on rangelands over the last century has changed the structure, density, and species composition within forest and grassland communities. Conifers are expanding into riparian and grassland/sagebrush communities, conifer densities have increased within stands, and hazardous fuels have increased within areas historically maintained by moderate to high fire frequencies. High intensity fires are now more likely to occur in areas that historically experienced low intensity, frequent to moderately frequent fires. Due to fuel continuity, fires are also more likely to be of significantly greater size than those which historically occurred. Large scale, high intensity fire presents risks to wildlife security cover, watershed stability, sensitive fish and wildlife habitat, human life and property.

Due to the lack of fire disturbance, conifers are encroaching into aspen, grassland and sagebrush habitat, and Douglas-fir savannah structure is being replaced with multi-storied, dense conifer stands. The recent drought and increased competition for limited resources has resulted in increased forest susceptibility to insect and/or disease infestations and subsequent tree mortality.

Historical Fire Regimes

In fire adapted ecosystems, recurrent fire is the dominant disturbance that affects vegetation patterns. One method to describe this disturbance is by using fire regimes (Table 11). The fire regime concept is used to characterize the personality of a fire in a given vegetation type, how often it visits the landscape, the type of pattern created, and the ecological effects. The historical fire regimes for the watershed are arranged based on fire severity and fire frequency.

Table 11. Historical Fire Regimes

Historical Fire Regimes	Severity (% Overstory Replacement)	Fire Interval (Years)	Acres*	Representative Ecosystem
NL -- non-lethal	low - <20%	10 to 25	2,047	Dry pine, conifer encroachment and juniper forests
MS1 -- mixed severity, short interval	low - 20-30%	20 to 40	7,398	Lower elevation conifer forests
MS2 -- mixed severity, long interval	mod - 30-80%	40 to 120	5,208	Shrublands, mixed conifer forests
MS3 – mixed severity; variable interval	variable - 10-90%	45 to 275	6,280	Higher elevation conifer forests
SR1 -- stand replacement, short interval	high - >80%	95 to 180	11,825	Certain lodgepole pine, dry Douglas-fir forests
SR2 -- stand replacement, long interval	high - >80%	200 to 325	45	High elevation whitebark pine, spruce-fir
SR3 -- stand Replacement non-forest	high - >80%	<35	212,191	Grasslands, many shrub communities

* The acreage calculation for each historical fire regime is based on the hydrologic unit scale. They include all ownerships to more accurately describe the current situation. Acreage discrepancies occur through calculations made in GIS.

Current Condition Classes

Fire Regime Condition Class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy et al. (2001) and Schmidt et al. (2001), based on a relative measure describing the degree of departure from the historical natural fire regime. This departure is from changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought).

Three Condition Classes were developed to categorize the current condition with respect to each of the historic Fire Regime Groups. The three classes are based on low (Condition Class 1), moderate (Condition Class 2), and high (Condition Class 3) departure from the natural (historical) regime (Hann and Bunnell 2001, Hardy et al. 2001, Schmidt et al. 2001). Criteria used to determine current condition class includes the number of missed fire return intervals with respect to the historic fire return interval and the current structure and composition of the system resulting from alterations to the disturbance regime. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside. The relative risk of fire-caused losses of key ecosystem components increases as condition class designation increases.

The FRCC classifications for the BTW based on the coarse-scale data are presented in Table 12.

Table 12. Fire Regime Condition Class

Condition Class	Description	Acres*	Example of Typical Management
1	Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within a historical range. Fires burning in CC1 lands pose little risk to the ecosystem and have positive effects to biodiversity, soil productivity, and hydrologic processes.	24,509	Historical fire regime is replicated through periodic application of prescribed fire or through fire use.
2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased) resulting in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range. Wildland fires burning in CC2 lands can have moderately negative impacts to species composition, soil conditions, and hydrological processes.	215,672 (NOTE: Actual forested cover in this condition class is approx. 3,481 acres. The remainder is sagebrush/ grassland.)	Moderate levels of restoration treatments are required, such as a combination of prescribed fire with mechanical/hand treatment.
3	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals resulting in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range. Wildland fires burning in CC3 lands may eliminate desired ecosystem components, exacerbate the spread of unwanted non-native species, and result in dramatically different ecological effects compared to reference conditions.	4,812	High levels of restoration treatments, such as mechanical treatments, are required before fire can be used to restore desired ecosystem function. Intensive efforts, which may include seeding, herbicide application, biomass removal, and other types of rehabilitation, are required for CC3 lands.
Current conditions are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, grazing, introduction, and establishment of exotic plant species, insects or disease (introduced or native), or other past management activities (Laverty, Williams 2000).			

* The acreage calculation for each condition class is based on the hydrologic unit scale. They include all ownerships to more accurately describe the current situation. Acreage discrepancies occur through calculations made in GIS.

Fire occurrence records from the BLM, the U.S. Forest Service and the Montana DNRC indicate fire suppression resources have responded to approximately 13 wildland fires within the analysis area since 1981. Most fire starts were lightning caused. Due to changes in record-keeping and agency policy, this number represents the lowest possible number of fire suppression responses by the federal and state agencies during this time period.

In general terms, the Sweetwater side of the watershed is predominantly grassland/sagebrush with island patches and stringers of conifers. The Blacktail side of the watershed is predominantly forested from near the valley floor into the mountains.

Sweetwater Side
Douglas-fir, limber pine (*Pinus flexilis)*, and Rocky Mountain juniper are present in scattered patches and stringers on the Sweetwater side of the watershed. Limber pine occurs in patches primarily on rocky slopes and outcrops. Douglas-fir and juniper are expanding into grassland/sagebrush uplands at a relatively slow rate and in a scattered pattern. Douglas-fir and juniper encroachment into draws and riparian areas is extensive and is resulting in a species composition shift from riparian dominated vegetation (aspen, cottonwoods, water birch, etc.) to conifer dominated. Spruce budworm is affecting Douglas-fir where it occurs in patches; however this activity appears to be at an endemic level. Limber pine is exhibiting relatively high vigor and does not appear to be impacted by white pine blister rust or mountain pine beetle.

Blacktail Side
Lower elevations on the Blacktail side are dominated by relatively young and some scattered old remnant Douglas-fir trees. Many of the remnant trees bear evidence of historic frequent to moderately frequent fire prior to the last 100 years. Fire scarred trees in Price's Canyon indicate at least five fires from 1588 to 1877 (Arno and Gruell, 1983). Most drainages and other accessible areas were logged prior to the 1930's, and the spacing of stumps indicates a savannah structure (large diameter trees in low densities) was historically more common. Density and structure of these stands has shifted due to fire exclusion, resulting in a higher than historic stocking levels and encroachment into mountain meadows and sagebrush openings. Pole and small sawlog size Douglas-fir with no evidence of fire activity have filled in between large-diameter trees, resulting in a mostly continuous canopy throughout the lower elevations of the Blacktail Mountains. Douglas-fir encroachment is evidenced by sagebrush remnants found beneath closed tree canopies. Due to increased sunlight, nutrients and moisture, Douglas-fir expanding into sagebrush and meadow habitats are growing at a much faster rate than Douglas-fir filling in within stands. Spruce budworm was prevalent along Blacktail Ridge and was likely at epidemic levels in 1980; budworm activity has increased in the past few years, but is mostly affecting young Douglas-fir and is currently at endemic levels. While spruce budworm does not usually cause direct tree mortality, it will predispose trees to attacks by other insects or diseases. Douglas-fir bark beetle has killed small patches of large diameter Douglas-fir in the East Fork, but is currently at endemic levels.

As elevation increases, lodgepole pine (*Pinus contorta)* occurs intermixed with Douglas-fir and in pure patches, and limber pine occurs on dry, harsh sites. Mountain pine beetle activity has increased greatly in the last few years, and is at epidemic levels in the East Fork. Mortality of lodgepole due to mountain pine beetle is occurring in small isolated patches along Blacktail Ridge, and in large patches mostly on Forest Service land in the East Fork. Much of the limber pine population is dead or dying due to mountain pine beetle (on mature trees) and/or white pine blister rust (on seedlings/saplings).

Higher elevation forests consist of subalpine fir (*Abies lasciocarpa)* mixed with Douglas-fir, lodgepole pine, Engelmann spruce in moist areas, and whitebark pine (*Pinus albicaulis)* on harsh sites. Balsam bark beetle activity is increasing and has resulted in mortality of subalpine fir throughout the watershed. Spruce beetle is resulting in limited

mortality of Engelmann spruce. Both balsam bark beetle and spruce beetle are currently at endemic levels with activity increasing recently. Whitebark pine are being affected by mountain pine beetle and/or white pine blister rust, however mortality is less than in most other areas administered by the Dillon Field Office.

Findings, Analysis and Recommendations

Fish habitat in some streams in the BTW is being impacted by changes in stream morphology, vegetative composition and cover, conifer encroachment into riparian communities and noxious weed infestations. Teddy Creek showed some impacts from livestock grazing and trailing, but overall livestock were not an issue on fish habitat with the BTW. Within the BTW, the greatest current threat to native WCT is the threat of extirpation through competition and predation from non-native eastern brook trout and hybridization from non native rainbow trout. Fisheries habitat conditions on streams within the BTW ranged from fair to excellent.

Beaver activity was noted in the East and West Forks of Blacktail Deer Creeks, Sweetwater Creek, and Alkali Creek. Few other tributaries to these main arteries have existing suitable habitat. This is evident by recent beaver activity and relic dams within the drainages. These habitats are essential to sustain amphibian populations within the watershed.

As discussed above under the Riparian section, Cooks Lake and the associated wetland complex was FAR due, primarily to livestock impacts around the perimeter of the lake and springs. Excessive hummocking around the perimeter of the lake tends to have a drying effect which could reduce habitat for tiger salamanders and other amphibian inhabiting the lake.

The wildfires in the Moose Creek and Elk Gulch drainages have decreased much of the juniper in the upper reaches and has improved aspen regeneration, but has also altered much of the riparian corridor by down cutting in the lower reaches.

Sagebrush habitat that burned in 1988 is now similar to pre-burn habitat conditions. The BTW has a good mosaic of sagebrush habitat at different seral stages that is supporting diverse wildlife populations. Pygmy rabbit surveys in 2006 verified populations still exist in the Sweetwater AMP and Spring brook isolated allotments and documented populations on public lands in the Rock Creek and Spring Brook allotments. Sagebrush habitat plots established in the BTW in 2006 indicate that we are currently meeting habitat guidelines outlined in the *Management Plan and Conservation Strategies for Sage Grouse in Montana*. Riparian habitat conditions, crucial for sage goruse brood rearing, are most likely more of a limiting factor in the BTW than existing sagebrush habitat.

The Sweetwater basin and Blacktail Ridge remain the centers for activity for sage grouse in the BTW. There are eight known leks within the BTW. Sage grouse populations in area have fluctuated in the past, but recent lek counts reflect that the population is stable.

Many existing fences have been modified or constructed to improve passage by large ungulates in the past. However, wildlife movements are being inhibited throughout the watershed by livestock fencing that is not meeting BLM specifications. Fencing that is no longer serving its function also creates a problem when it becomes strung across the allotments.

Big game population trends have remained stable in the past 10-20 years (pers. com. Bob Brannon FWP.) Post harvest production surveys show good recruitment for moose, mule deer and elk. The exception is antelope where the population trend and recruitment is down in the past 15 years. However the population has remained relatively stable for the last five years. Winter big game habitat monitoring on public lands indicate habitat is in good condition which is consistent with the upland standards being met on all but one allotment in the BTW. Forested security cover is the primary limiting factor for big game in the BTW.

Forest health concerns include departure from the historic range of variability (species composition, structure, etc.), increased fuel loading, and occurrence or high susceptibility for insect/disease outbreak. Across the south and west sides of the Blacktail assessment area, the potential for stand replacing wildfires has increased due to the increased density of forested stands.

Conifer encroachment into riparian areas was a noted concern on the Sweetwater AMP and Timber Creek allotments. The unleased tracts along Blacktail Ridge had a high degree of limber pine mortality due to mountain pine beetle and white pine blister rust.

The National Fire Plan, Healthy Forests Initiative, and Healthy Forests Restoration Act emphasize reducing hazardous fuel accumulations and restoring the health and natural processes within forests and rangelands. In addition, management should prioritize the protection of areas that enhance, restore, or maintain plant communities that are critical for endangered, threatened, or sensitive plant and animal species. As a result, the use of prescribed fire and/or mechanical treatments, or other means of treating hazardous fuels, to promote healthy forest conditions will be incorporated into land use planning.

Based on the coarse-scale FRCC analysis, site-specific assessments, and historic photos of the area, forest and woodland habitats in the BTW are moderately departed from natural (historic) conditions. Limber pine habitats are severely departed from natural (historic) conditions and are FAR with a downward trend; all other forest habitats are PFC with concerns.

Recommendations for Biodiversity:

1. Modify existing wildlife barrier fences wherever they occur. Construction of new fences should be evaluated as to the potential to restrict wildlife movements. Remove fences no longer needed for management purposes.

2. Continue sagebrush habitat inventory to identify important sage grouse seasonal habitats with emphasis on locating active leks and brood-rearing habitats. Follow recommendations in the *Management Plan and Conservation Strategies for Sage Grouse in Montana* to improve habitat conditions for all sagebrush obligate species.

3. Focus on deciduous woody riparian vegetation recruitment to improve existing riparian habitat conditions and maintain biological integrity.

4. Fence Cooks Lake and associated wetland habitat to prevent livestock access and improve aquatic and riparian habitat Consider an off-site watering location for livestock, depending on proposed livestock management and/or authorizations in this area.

5. Ensure that all stock tanks in the watershed are outfitted with an operational wildlife escape ramp.

6. Manage juniper-dominated riparian habitats to restore deciduous woody species.

7. Analyze the use of prescribed fire, mechanical treatments, or other means to mitigate conifer establishment and domination in aspen clones, conifer encroachment into sagebrush sites and/or riparian areas, and address other site specific concerns. Focus treatments within areas that are in Condition Class 2 and 3 and in areas historically dominated by aspen, whitebark pine, and Douglas-fir savannah.

8. Consider developing and implementing a Fire Use Plan for the Blacktail Mountains Wilderness Study Area.

9. Manage herbaceous composition to reduce disturbance-induced species.

10. Implement management measures that will improve streambank stability and increase willow and sedge cover to improve WCT habitat on Teddy creek.

11. Follow recommendations by the IDT for mitigating resource concerns in the riparian areas associated with the streams in the BTW which will address fisheries habitat issues.

General Recommendations for Watershed

1. Implement off highway vehicle (OHV) designations from Dillon RMP and rehabilitate closed roads and trails as necessary to discourage future motorized use of these routes.

2. Develop alternatives regarding livestock management for the "unleased" public land along the top of Blacktail Ridge that, prior to 2004, had been withdrawn as the Blacktail Stockdriveway (approximately 6,088 acres). Alternatives may include combining this area with adjacent existing allotments and including mandatory terms and conditions for proper livestock management, excluding portions of this area from livestock grazing or a combination thereof.

Interdisciplinary Team Composition

Core IDT members for the BTW Assessment include:
Kelly Bockting, Wildlife Biologist - IDT leader
Bart Howells, Rangeland Management Specialist
Kipper Blotkamp, Fuels Specialist
Paul Hutchinson, Fisheries Biologist
Steve Armiger, Hydrologist/Riparian Coordinator
Pat Fosse, Assistant Field Manager – Renewable Resources
Aly Piwowar, Forester

Support IDT members include:
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Jason Strahl, Archeologist
James Roscoe, Wildlife Biologist
Michael Mooney, Weeds Specialist
Brian Hockett, Rangeland Management Specialist TES-plants
Rick Waldrup, Outdoor Recreation Planner/Wilderness Specialist
Bob Gunderson, Geologist

Other specialists involved:
Mike Philbin, MSO Hydrologist and Riparian Program Lead
David Early, Rangeland Management Specialist
Ryan Martin, Rangeland Management Specialist
Tim Bozorth, Dillon Field Manager
Brian Thrift, Rangeland Management Specialist
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Gary Berger, Soils Scientist, USDA, NRCS
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Chuck Maddox, Rangeland Specialist, DNRC
Fred King, Game Range Manager, MFWP

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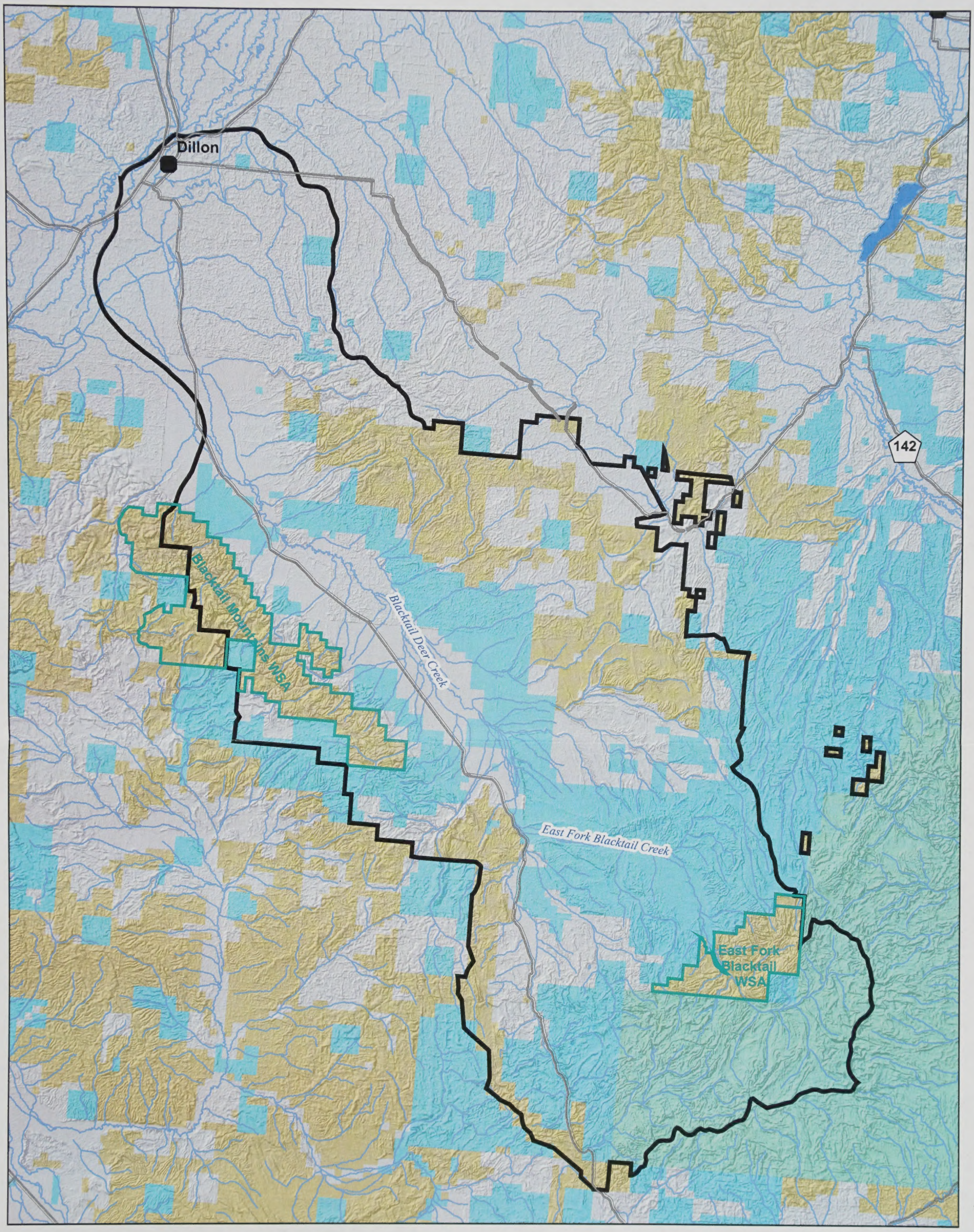
Map A - Blacktail Watershed Assessment Area

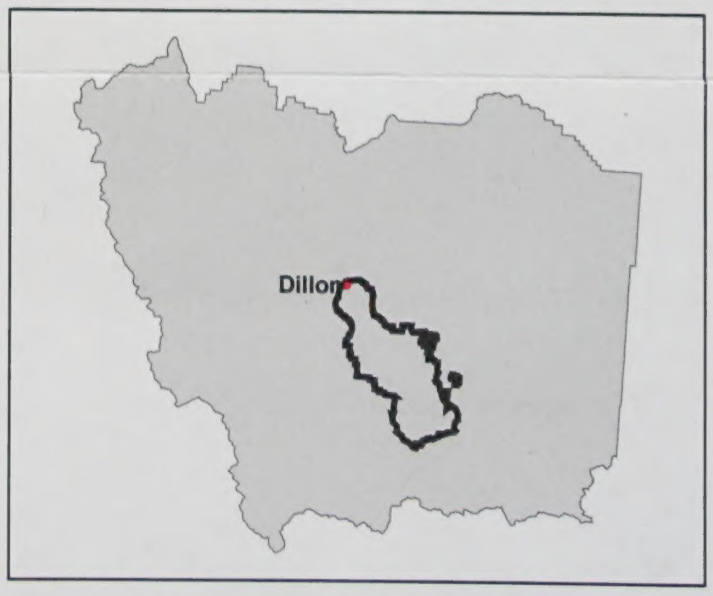


0 1 2 4 6 8 Miles

N

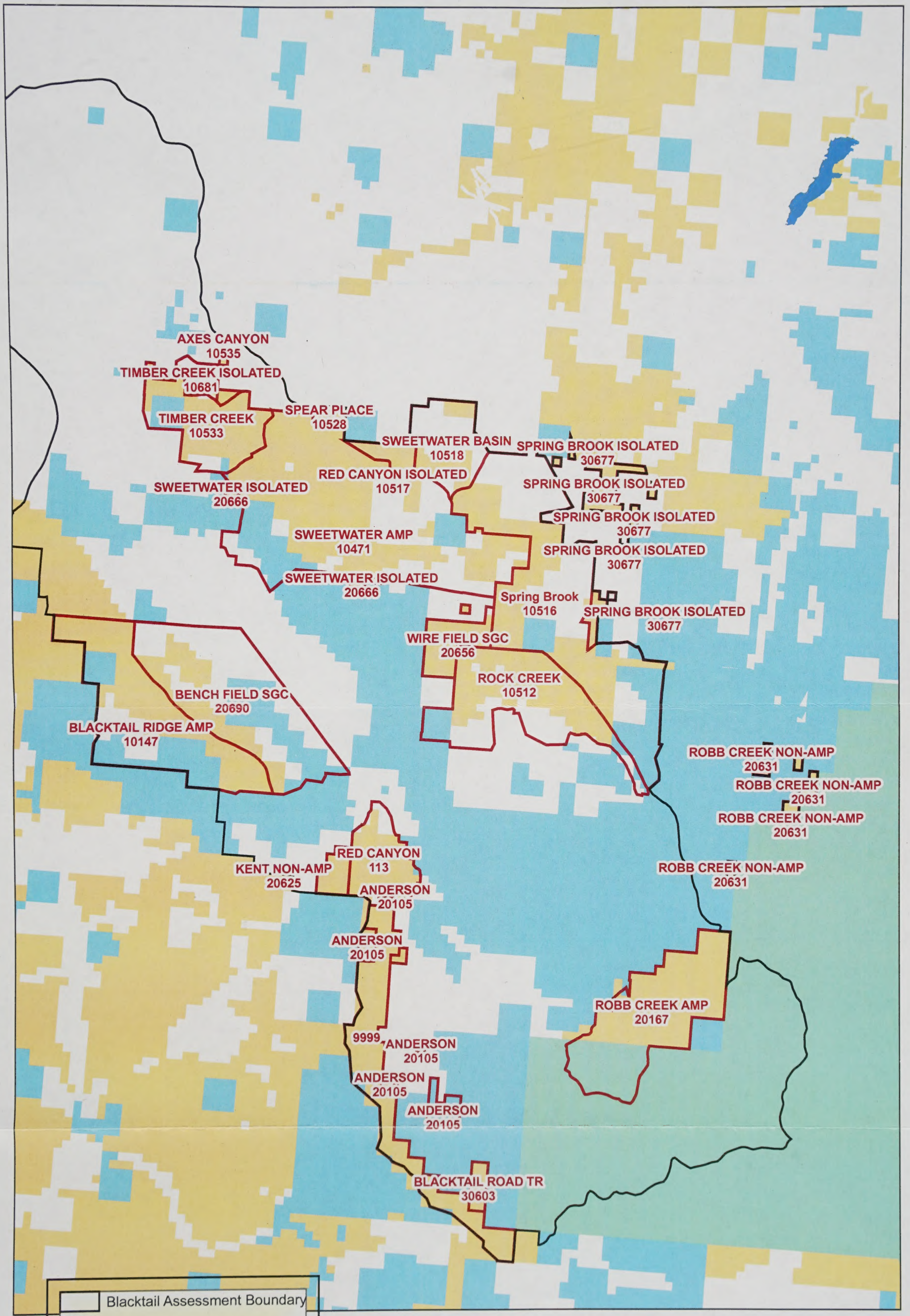
- Blacktail Assessment Area
- Wilderness Study Areas
- Main Roads
- Bureau of Land Management
- Bureau of Reclamation
- Forest Service
- State of Montana
- Private
- Lakes
- Towns/Cities

Vicinity Map of Sage Creek Watershed Area



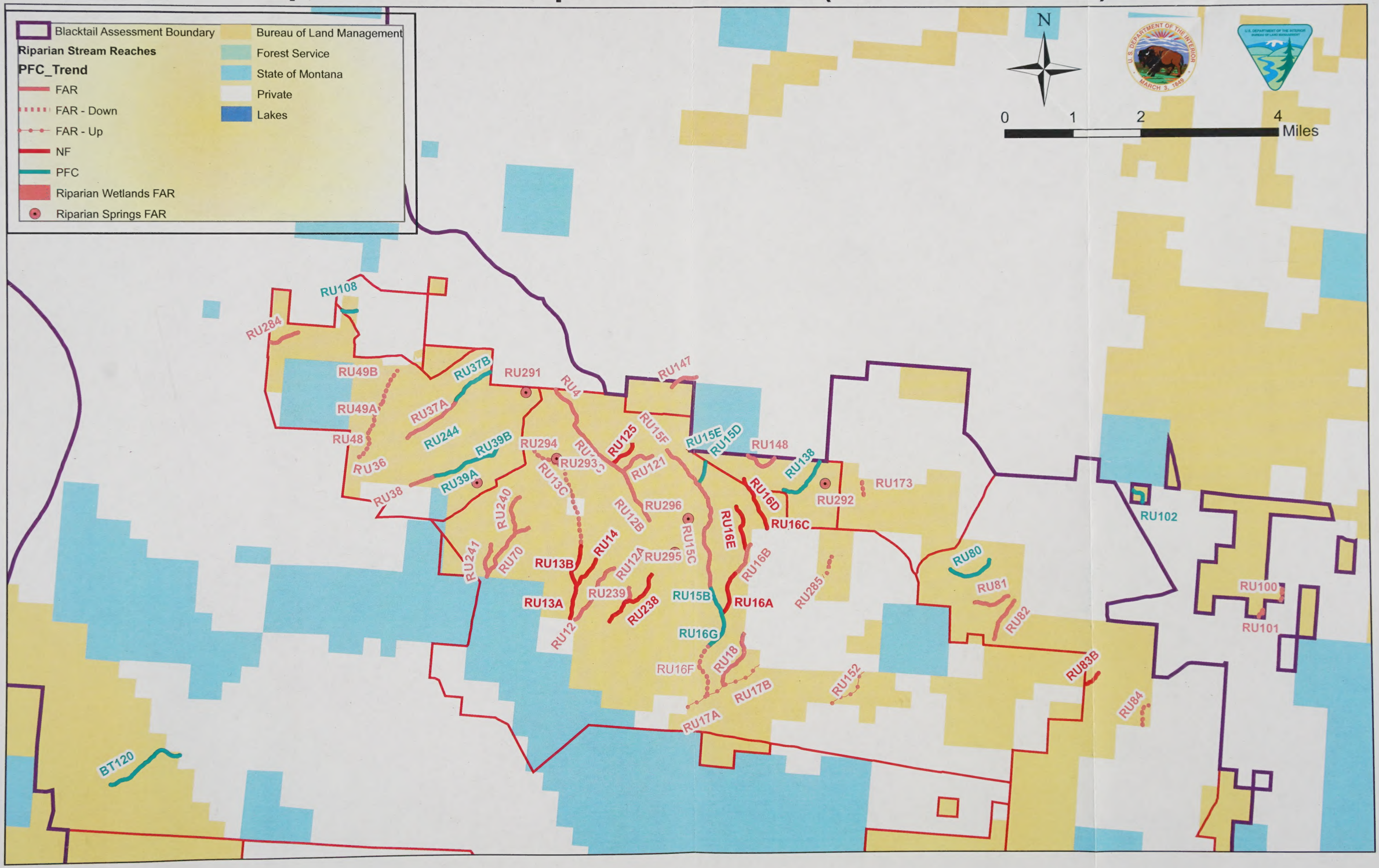
Web Application Vulnerability Assessment

Map B - Blacktail Grazing Allotments

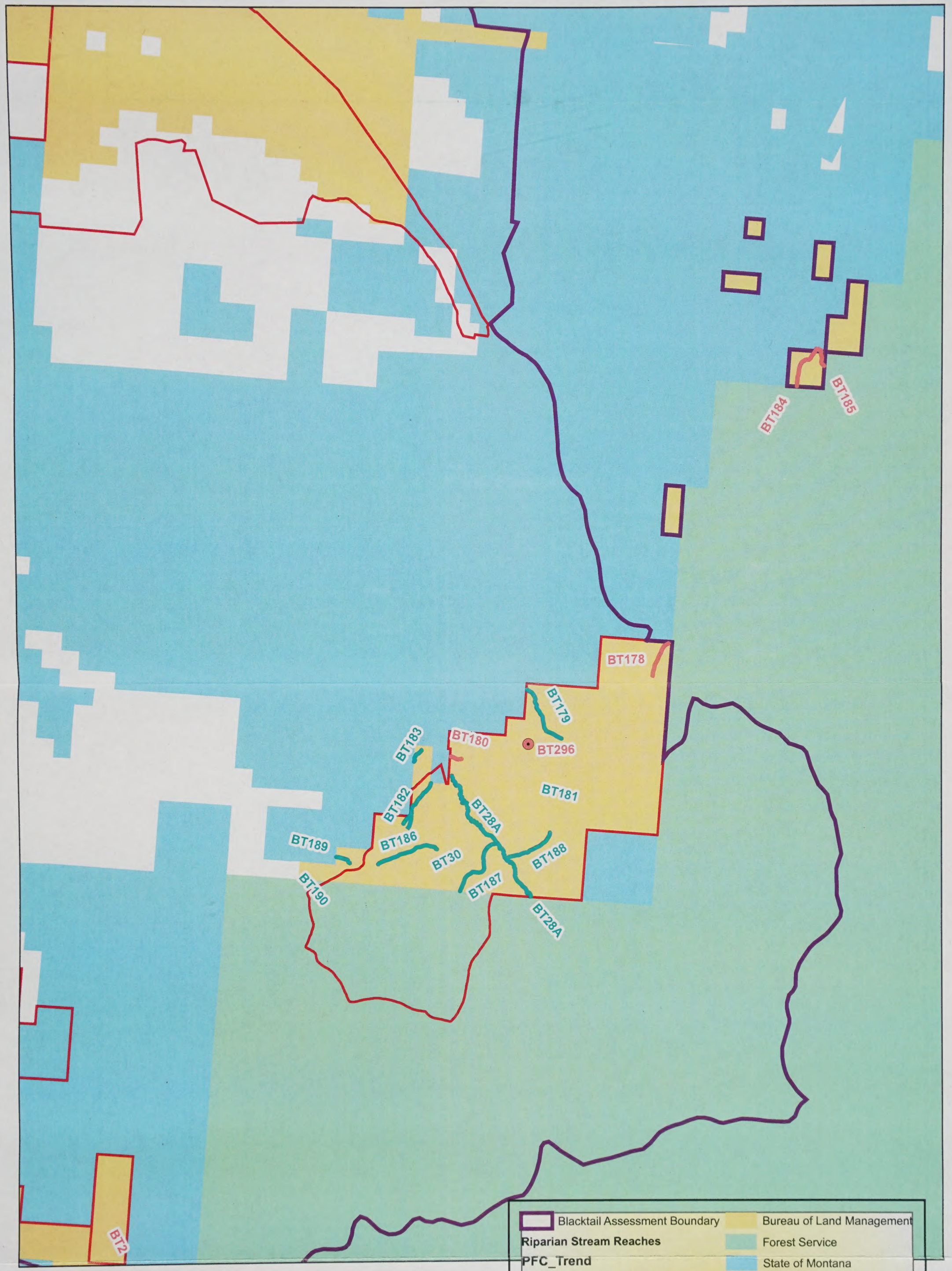


Map B - Blackstill Grassing Allotments

Map C - Blacktail Riparian/Wetlands (Northern Portion)



Map D - Blacktail Riparian/Wetlands (Southeast Portion)



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Map E - Blacktail Riparian/Wetlands (Southwest Portion)

Plan E · Biecki Kibuc Wegetarianska (zamknięta) Brama Północna